Evaluation of physical activity levels (low, moderate, high) among Iranian elderly and its relationship with mental health and quality of life[1]

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WCCPRD4111477 | 2015/556658

[1] This research supported with WHO/EMRO as source of funding as RPPH grant 14-35

Abstract
The purpose of this descriptive study was to identify the evaluation of physical activity levels (low, moderate, high) among Iranian elderly and its relationship with mental health and quality of life. The research population includes 60 years old and above elderly in all the 22 regions of Tehran. According to the latest census conducted in 2011, the elderly population is about 1,102,123 people. Considering the increasing number of elderly population in later years, the sample will consist of 7500 people. A multi-stage random sampling procedure was used. For this purpose the city of Tehran will be geographically divided into 5 sections including North, South, East, West and Center. Then one region from each geographical section and three areas from the chosen region were selected by simple random sampling method. Then, 5 Garden Park were selected randomly of each selected area. At the end, 100 elderly were recruited according to the inclusion and exclusion criteria. Also, all participants were free to not answer any question. All data in each selected geographic area will be collected by 10 experienced examiners with at least a master's degree in the fields of sports psychology, senior sociology or motor behavior. These individuals will be already taught to interact properly with seniors. All questionnaires will be completed by elderly individuals themselves or by the help of examiners. In this research we use 4 questionnaires

(the international physical activity questionnaire (IPAQ), quality of life questionnaire (WHOQOL-26), general health questionnaire (GHQ-28) and demographic questionnaire) for data collection.

The results showed that there is not significant correlation between low level of physical activity with mental health and quality of life in each and total regions. Furthermore, results showed that there are negative and significant correlations between moderate and high levels of physical education with total score of mental health and quality of life. Also, results showed that the high level of physical activity has an effect on mental health and quality of life in elderly people and was predictor its. This variable can predict 23% and 29% of the variance in mental health and quality of life, respectively. Results showed that there are significant and negative correlation between mental health and quality of life in each and total regions of Tehran, except severe depression with physical health, psychological health, social relationship and average score of WHOQOL scale, and average score of GHQ-28 scale with psychological health in south region. On the other hand, results of one way ANOVA test showed that the differences in average scores of mental health and quality of life components with levels of physical activity for each and all regions were significant. Furthermore, results of MANOVA test showed that the difference of main and interaction effects for mental health and quality of life components for the level of physical activity in each and total regions were significant. The main effect of level of physical activity for mental health and quality of life components were significant. The Bonferroni post hoc test showed that there are the

significant differences between mental health and quality of life components in levels of physical activity. Also, the average scores of these components in elderly people with high level of physical activity were better than the elderly people with low and moderate levels of physical activity. Results showed that the main effect of regions for mental health and quality of life components were significant. The interactive effect of level of physical activity and type of region was significant for mental health and quality of life components.

According to the results of this study, the moderate and high levels of physical activity are one of the important factors that were influenced and predicted mental health and quality of life among elderly people. Thus, with the support of physical activity programs, promotion and advertising its anti-aging effects can be helped to have a health community.

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Chapter one: Introduction

According to the United Nations reports, it has

been predicted that the elderly population of about 600 million will increase to two billion over the next 50 years (1). This phenomenon can be attributed to advances in science, health, society and technology. Scientific and technological development has made progress in various aspects of human life, but has also led to sedentary lifestyle and getting away from nature and natural needs. This in turn provides the potential for physical, psychological and social illnesses (2, 3). The importance of physical activity for all ages, especially the elderly as the vulnerable population in each society, is well known. According to research results, physical activity and exercise play an important role in reducing anxiety and depression, increasing the spirit of joy, life satisfaction and removing the monotony of life (5). Researchers believe that the assessment and recognition of physical activity level among communities and different age groups is important. Because high levels of physical activity plays an important role in promoting mental health and quality of life and reduces the level of depression in lifetime (6).

Considering the specific needs of the elderly period, physical and mental health promotion behaviors are important issues that have been largely neglected. Accordingly, the quality of life is one of the most

important psychological variables related to health and wellbeing of the elderly (7, 8). Health-related quality of life is defined as physical, psychological, social and familial wellbeing (8, 9). It influences the emotions, expectations, experiences, and beliefs of older adults (10). Researchers believe that the quality of life in elderly means having independent life, sense of well-being, and good function during the day (9, 10). Quality of life is a well-known basic index which includes several aspects of human such as physiological, functional and individual; therefore it is remarkably worth noting (11).

In addition, mental health of the elderly is an important issue in each society that should be evaluated objectively and regularly by officials, researchers and health professionals. Since the body and mind influence each other, their well-being leads to general health. Therefore, Addressing the issue and identifying the permanent effects of body and mind on each other is essential (5). According to the World Health Organization (WHO), definition of health does not merely include the physical aspect; it also contains mental and social health, the ability of having harmonious relationship with others, modifying the individual and social environment, and resolution of the conflicts and personal desires logically, justly

and properly. According to related research, older people with higher physical activity level, have more favorable levels of mental and general health (21, 22)

Rütten et al. (2004) investigated the relationship between physical activity and mental health in 17 countries in the Europe Union. They found a positive relationship between physical activity and mental health in general, but such a relationship was not observed in some countries such as Greece, Austria and Italy (23).

Melinda et al (2009) also revealed a significant positive relationship between the average level of physical activity and mental health in men and women with high levels (24). In several studies, researchers have emphasized that the relationship between physical activity and mental health requires special attention. This issue is more complicated than the relationship between physical activity and physical health. This complexity is due to (a) inability of studies to determine the Optimum thresholds or intensity, type, frequency and duration of physical activity to improve their health status, (b) Individual differences in response to periodic physical activity programs, (c) and different relationship between physical activity and mental health due to personal characteristics.

Investigating the level of physical activity in different countries have shown that the prevalence of low level of physical activity and inactivity to be 68 percent in united states, 67.7 percent in Australia, 80.7 percent in Brazil and 53 percent in India (2,3,25,26). But the exact number is not known for Iranian elderly population, therefore the importance and necessity of investigation it this area is justified. The aim of this study was to assess the level of physical activity (low, moderate, high) and its relationship to mental health and quality of life in Iranian elderly population.

OBJECTIVES

1. General objective

The general objective of this study was to assess the physical activity levels (low, medium, high) in Iranian elderly and its relationship to mental health and quality of life.

2. Specific objectives:

1. To assess the level of physical activity of elderly in each and total regions in Tehran.

2. To investigate the relationship between three

levels of physical activity and mental health of elderly in each and total regions in Tehran.

3. To assess the relationship between physical activity and quality of life of elderly in each and total regions in Tehran.

4. To assess the ability of levels of physical activity in predicting mental health and quality of life in elderly in each and total regions in Tehran.

6. To investigate the relationship between quality of life and mental health among elderly in each and total regions of Tehran.

Hypothesis

1. There is a significant relationship between levels of physical activity and mental health in elderly in each and total regions in Tehran.
2. There is a significant relationship between levels of physical activity and quality of life in elderly in each and total regions in Tehran.
3. Which level of physical activity is more able to predict mental health in elderly in each and total regions in Tehran?
4. Which level of physical activity is more able to predict quality of life in elderly in each and total regions in Tehran?

5. There is a significant relationship between quality of life and mental health of elderly in each and total regions in Tehran.

6. The average score of mental health is significantly different with levels of physical activity of elderly in each and total regions in Tehran.

7. The average score of quality of life is significantly different with levels of physical activity of elderly in each and total regions in Tehran.

8. The average scores of mental health components are significantly different with levels of physical activity of elderly in each regions in Tehran.

9. The average score of quality of life components are significantly different with levels of physical activity of elderly in each regions in Tehran.

Definition of Terms

The following terms are defined for the purposes of this project.

Level of physical activity

Mental health

According to World Health Organization (WHO) definition, the mental health includes "subjective well-being, perceived self-efficacy, autonomy, competence,

inter-generational dependence, and self-actualization of one's intellectual and emotional potential, among others (38). This variable was operationally defined as scores on General Health Questionnaire-28 (GHQ-28).

Quality of life

Quality of life (QOL) is the general well-being of individuals and societies. QOL has a wide range of contexts, including the fields of international development, healthcare, politics and employment (39, 40). The short version of the World Health Organization Quality of Life Questionnaire (WHOQOL-26) will be used to assess and define the quality of life.

Chronological age

Chronological age defined as the number of years a person has lived. This variable was operationally defined as score that person written in the demographic data questionnaire.

Chapter Two: Review of Literature

The organization of this chapter is as follows. First, a review of the literature on physical activity and health among elderly people will be presented. Secondly, the level of exercise and physical activity among elderly people and factors that affecting

exercise behavior will be presented. Finally, a review of the relationship between physical activity and psychological variables such as mental health, social health and quality of life will be provided.

Physical Activity and Health among Elderly People

One area of research that has become a strong focus is physical activity and the impact that it may have on both physical and mental health. Current research that has been conducted suggests that 50 percent of the decline that is usually attributed to physiological aging is in fact due to disuse resulting from inactivity (43-45). The loss of physical function is therefore no longer considered an inevitable consequence of aging. This view has had a great impact on attitudes towards physical activity and in fact promotes an active lifestyle (43). For many senior citizens, as well as younger individuals, however, there has been little motivation and interest to sustain a physically active life-style. Individuals are busy with work and other sedentary activities and the thought of exercising is viewed as a chore. It has been suggested in the literature, however, that most elderly people can benefit from a properly designed exercise program (46). Exercise, healthful dietary and living habits are reported to decrease the physical burdens of

aging, enhance psychological factors (such as emotional well-being, mental health, quality of life, self-esteem and etc), and increase the likelihood of living to one's full life expectancy (39,41,45). Also, the American College of Sports Medicine/American Heart Association (ACSM/AHA), reported that physical activity and exercise may reduce the risk of psychological diseases in elderly people (48). Stephens (1988) stated that "there appears to be a negative correlation between physical activities, exercise and lower depression scores in elderly people." In addition to changes in affect, the physically active elderly people seem to experience change in quality of life (7), perceived physical and mental health status, (49,50), cognitive function (51) and sleep quality (52). Based on national institute on aging reports (1998), the physical activities directly impact body endurance, strength, balance, and flexibility, and each of these is important for staying healthy and independent.

Endurance activities increase heart rate and breathing for extended periods of time. They improve the health of the heart, lungs, and circulatory system, and have been shown to help prevent or delay some diseases associated with aging, such as diabetes, arthritis, heart disease, and others. Strength activities increase cardiac and musculo-skeletal

function, and consequently, older adults remain strong enough to do the things they need and like to do. Balance activities help prevent falls, which are a major cause of disability in older adults. Stretching and flexibility activities help keep the body in line and maintain flexible range of motion (ROM). (53,54).

However, national data (from U.S. HHS, 2000) indicate that 51 percent of older adults aged 65 to 74 years and 65 percent of those over 75 years engage in no leisure time physical activity (56). Furthermore, the physical activity level in the elderly has not improved over the last decade. Socially and economically, the results of physical inactivity directly connect to increased medical expenditure. A report revealed that the medical cost induced by physical inactivity and obesity was approximately 10 percent of national health care expenditure (56). Furthermore, the study of Colditz (1999) showed that the medical costs for elderly people are four times higher than those for adults under 40 years old.

For the past several decades, health care professionals have been concerned about sedentary lifestyles and inconsistent physical activity among the elderly people (55-57). A number of studies have examined various issues surrounding characteristics of

habitual physical activity among the elderly people (58).

In addition, maintenance of regular physical activity appears to differ depending on the physical activity setting. In elderly people, maintenance of regular exercise and physical activity in a structured program is higher than that in a natural setting. Studies showed that the adherence rate averaged from 81 to 91 percent during 6 months in a structured exercise and physical activity setting (59,60), while the adherence rates for home-based programs ranged from 11 to 66 percent (61). A national survey revealed that only 16 percent of adults aged 65 to 74 years and 12 percent of those aged 75 years and older engaged in moderate physical activity for at least 30 minutes, five or more days per week in 1997 (55). In another study, Rech et al. (2014) investigated the relationship between environmental, social and individual factors with physical activity level. 1461 subjects aged 18-69 years were studied. Results showed that the social support from family and friends, enjoying life and life satisfaction variables have significant positive correlation with the level of physical activity of individuals (30).

These physical and psychological benefits of

exercise and physical activity have become important factors especially in the area of health care and are consistent with the current emphasis on mind-body unity (44). The mechanisms underlying the mind-body unity have been of great interest and several studies have attempted to explain the relationships between exercise and mental health. A correlation between physical and psychological disorders has been suggested, and an article by Plante and Rodin (1990) outlines the effects of exercise in terms of biological and psychological mechanisms (47).

Exercise and physical activity

Mounting evidence indicates that physical activity is a key factor in preserving physical ability in old age, that a sedentary life hastens decline in physical functioning and predicts an excess mortality risk, and that even low intensity activity imparts benefits among previously sedentary people (62,63). The following review of the literature indicates that, in general, the benefits of exercise or physical activity for older adults outweigh the risks.

The amount and type of exercise required to elicit the benefits of exercise for older adults has been debated in the literature. It has generally been accepted that a regular, moderate-level, low intensity

exercise regimen is most beneficial for older adults. The Surgeon General, the American Heart Association, the Centers for Disease Control and Prevention, and the American College of Sports Medicine all emphasize that health benefits do not require highly strenuous activity, but will accrue from participation in activities of moderate intensity (64). McMurray, Ainsworth, Horrell, Griggs, and Williams (1998) also state that moderate level of physical activity has been found to be all that's needed and that high levels provide no further benefits. These researchers conducted a 5-year cross-sectional intervention trial with a sample of 1,664 Basic Law Enforcement Trainees (BLET) from programs at 25 sites located throughout North Carolina. The subjects were randomly assigned to 3 intervention groups. The first group (n=816) was subjected to a highly structured fitness program developed by the researcher and participated in a 9 week supervised exercise program. This program included 27 hours of physical activity administered in 1 hour blocks 3 times a week. Each session involved a warm-up, an aerobic session of running, cycling, or a calisthenics circuit, resistance exercises, and a cool down. The second group (n= 691) participated in a standard exercise program devised by the local unit which emphasized resistance training with limited

attention focused on aerobic training. The third group (the control group; n=167) received no exercise program at all. All exercise programs were delivered by law enforcement officers who were trained as fitness instructors. The researchers found that small increases in aerobic power may ameliorate the cardiovascular disease risk profile by potentially lowering cholesterol and blood pressure. As a result, they propose that physical activity should be of sufficient intensity to increase aerobic power for it to have a positive impact on cardiovascular disease risk (65).

Other research has indicated that low impact, moderate-level exercise is most beneficial to older adults (66). Nelson (1998) investigated the use of weight training for improving physical strength in fifteen older adults residing in an extended care facility. Inclusion criteria included the mandatory use of a cane or a walker to ambulate. Upon completion of the study, a few seniors no longer needed a cane to walk or no longer needed a walker. This low impact weight training regimen was so well received by the participants that they continued on with the program after the research was completed.

Carroll et al. (1992) also suggest that a low impact, moderate-level of exercise is best tolerated

injury-wise and is more attractive to older adults while providing both mental and fitness benefits. In their study, a lower rate of injury occurred with low impact exercises such as walking, than with high impact exercises such as jogging. With low impact exercise the risk of orthopedic injury was reduced, along with the possibility of aggravating an existing orthopedic condition. It is considered to be generally safe for older adults to engage in such a level of light exercise and physical activity (66).

Information on the amount of exercise required to maintain the health of older adults is not as abundant as is information concerning the type of exercise best suited for seniors. Resnick (2000) reports that more beneficial effects were seen with regular exercise than with exercise performed sporadically (67). Regular exercise is considered to consist of a minimum of 20 minutes of continuous physical activity at least three times per week. Finally, research suggests that the benefits of regular exercise may even accrue to sedentary elderly who begin to exercise at an advanced age (65, 67).

Many physical benefits of exercise have been documented in the literature. Clark (1996) found that older adults who exercised reported that they slept

better, had a better appetite, and that they felt they were able to avoid or delay acute health events by regular exercise. Hombergh et al. (1995) and Birkel (1998) reported that exercising older adults had improved functional capacities and were able to prevent the occurrence of disability diseases. Musculoskeletal benefits of exercise include improved strength, flexibility, balance, joint range of motion and function, and enhanced muscular performance, (60,72).

Research has demonstrated an increase in maximal cardiac output, improved glucose tolerance and increased fitness levels associated with reduced mortality and increased life expectancy among exercising adults (71). Segal, Crespo, and Smit (1998) stated that the physical inactivity can lead to chronic diseases, premature aging, loss of physical independence, and premature mortality. The benefits of exercise are not limited only to older adults who have a history of regular exercise, but may be accrued by formerly sedentary and unfit individuals when they become active. The downward spiral of impairment may be halted and reversed in formerly inactive seniors (74).

Spirduso and Cronin (2001) investigated factors that influenced elderly people perception of their physical health. These researchers studied physical

functioning and well-being in older adults. They found that levels of physical functioning in older adults were related to feelings of well-being. Exercise was frequently reported by participants to be a positive influence on age-related changes of physical functioning (75).

Level of exercise and physical activity among elderly people

Rates of exercise and physical activity among older adults remain low (68). Less than 1/3 of older adults exercise regularly and less than 10 percent exercise vigorously Edward and Larson (1992) found that 50 percent of older adults who are not physically active have no intention of starting a regular exercise program to increase their activity level (69). According to the United States Department of Health and Human Services (2000), as people aged they tended not to participate in any leisure time physical activity. The Department reported that 42 percent of people 45 to 64 years, 51 percent of people 65-74 years and 65 percent of people 75 and older in the United States followed this pattern. A small percentage of this population participated in regular, moderate-level physical activity, such as walking and gardening: 30 percent aged 45-64, 31 percent aged 65-74, and 23 percent aged 75 and older. In addition, approximately

50 percent of sedentary elderly people who do start exercise programs stop them within the first six months of involvement (70). It is important to determine what factors play a role in older adults' decisions to not engage in exercise activities, as well as the factors associated with the high attrition rate among those who do start exercise programs.

In another study, Ribeiro et al. (2013) conducted a study to determine the level of physical activity of older people in urban areas of southern Europe. They evaluated 580 elderly aged 65 years old and above. The results showed that 62% of elderly had no physical activity (31). Also, Casta et al (2005) investigated the level of physical activity in Brazil in a cross-sectional study. 1968 subjects aged 20-69 years old were included. The results showed that the prevalence of inactivity was 80.7% (27).

Furthermore, Burton et al. (2000) assessed the physical activity of 18-64 years old Australian in a comprehensive study. 13,425 individuals were evaluated. Based on the results, inactivity and lack of physical activity in Australian citizens was 67.7% (3). Martin et al. (2000) in across-sectional study assessed the physical activity of 18-75 years old in United States. A Total of 2002 subjects were evaluated. Based on the

results, amount of physical activity in these people was 32% (2). Fisher et al. (1999) assessed the physical activity of 25-65-years old Hindi. 1376 participants were evaluated. Based on the results, inactivity and lack of physical activity was 53% (26).

Factors that affecting exercise behavior

A growing body of research has been reported concerning the physical, social, and psychological factors that affect the extent to which older adults engage in physical activity. Physical factors include physical disabilities, low functional status and high incidence of chronic disease (71,72). Specific disease entities that affect exercise participation include arthritis, osteoporosis, and chronic obstructive pulmonary disease. Natural pathological changes occurring with age can also affect exercising behavior. These changes include lower skeletal muscle glycogen stores as compared to younger people, loss of muscle mass, and muscle weakness (71).

Injury rates

Injuries among elderly people engaged in moderate-level physical activity are uncommon but, when they do occur, many are so minor as to require no treatment or reduction in activity. In Powell et al. (1998) study,

the 1994 Injury Control and Risk Survey was administered to 5,238 people 18 years and older in all 50 states via random-digit dialing of U.S. residential telephone numbers. Most injuries reported by all age groups were slight, with about 1/2 resulting from walking, gardening or bicycling. Interestingly, the researchers also found persons 45 years or older to be significantly less likely to be injured while walking or gardening than younger persons (73). Carroll et al. (1992) investigated the effect of 26 weeks of moderate and high intensity walking training on injury rates in the elderly. Twenty-eight healthy volunteers were recruited and assigned to 1 of 3 groups: the moderate intensity group, the high intensity group, or the control group. To achieve the prescribed training intensity, subjects walked uphill on a treadmill. The researchers found that injuries most commonly occurred with high impact exercises such as jogging. These injuries included tendonitis, shin pain, ankle and foot aggravation of an arthritic condition, groin-hip flexor pain, and lower leg pain from a pinched nerve (66).

Physical Activity and Psychosocial Factors

There are several key psychosocial factors that have an influence on one's physical activity participation. Pertinent psychosocial factors relating to physical activity engagement include mental health,

self efficacy, motivation, quality of life, and goal setting (7,68). These factors are unique in the manner in which they have an influence on individual persons' attitudes towards engagement in physical activity, and the maintenance of such behaviors. Investigating these factors individually can provide insight as to what interventional strategies are most efficacious in promoting initial increases in physical activity levels. Furthermore, such factors are integral in addressing maintenance of physical activity behaviors longitudinally. In this regard, Bustamante et al. (2013) examined the characteristics of physical activity and depressive symptoms in elderly. 174 individuals completed physical activity and depression questionnaires. Based on the results, moderate or high intensity physical activity had significant correlation with depressive symptoms (22). Furthermore, Lampinen et al. (2000) investigated the effect of age-related changes in physical activity and its relationship with the symptoms of depression in the elderly. 663 elderly people were evaluated over 8 years in this longitudinal study. The results showed that reduction in intensity of physical activity that occurs with aging is also accompanied with appearing depressive symptoms more quickly in the elderly (37).

Physical activity and mental health among elderly people

Physical activity has also been found to be beneficial for mental health. Many of the following studies focused on the adult population in general; however, the findings may also be applicable to seniors. The research demonstrates that exercise significantly reduces anxiety levels (73,76). Depression is also positively affected by exercise. Osness and Mulligan (1998) found an inverse relationship between exercise and depression: the greater the amount of physical activity, the lower the risk for depression and its symptoms (77). The National Institute of Mental Health has called depression among seniors a public health crisis. It is the leading risk factor for suicide in this age group. Depression is a biologically-based illness that can and should be treated (73). Spirduso and Cronin (2001) proposed that frequent exercising may benefit mood in older adults. These investigators found that older adults 60-75 years of age had fewer anxiety and depressive symptoms and higher self-efficacy after they had adopted a new physical activity and maintained it for 6 months. Moderate exercise is one low-cost/ low-risk modality that can help to effectively reduce or eliminate depression in seniors (75). Also, Kwag et al. (2011)

examined the effect of physical activity on mental health of elderly in South Korea. 567 individuals over 65 years old were studied. They found positive correlation between high physical activity level and mental health (33(. In another study, Park et al. (2011) conducted a study on the relationship between physical activity and mental health in people aged 18-64 years old in South Korea. Results showed a positive relationship between high levels of physical activity and mental health (34). Also, Melinda et al. (2009) evaluated the relationship between levels of physical activity and mental health. 6803 subjects 25-64 years old were examined. Levels of physical activity and mental health were evaluated using the International Physical Activity Questionnaire (IPAQ) and the General Health Questionnaire (GHQ12) respectively. The researchers found a significant positive relationship between the average level of physical activity in women and men with high levels of mental health (24). In a valuable study, Rütten et al. (2004) evaluated the relationship between physical activity level (using a questionnaire IPAQ) and mental health in 17 European Union countries. 16,230 individuals were studied. They found a positive relationship in general, but such a relationship was not observed in some countries such as Greece, Austria and Italy (23).

Physical activity also positively affects self-image. It adds balance to the older adult's life and can bring about a sense of accomplishment and well-being, improved self-esteem, reduction in physical and emotional tensions, enjoyment and increased self-confidence (62,63). Osness and Mulligan (1998) also found that increased levels of moderate but regular exercise behaviors resulted in greater feelings of well-being and improved self-image (77).

The beneficial effects of physical activity on mood and cognition are well-documented in the literature. Birkel (1998) examined the effects of movement experiences, in the form of Mideastem dance and relaxation, on the elderly cognitive functioning. These activities were found to stimulate the brain and induce a "heightened state of arousal" which facilitated increased interaction of older adults with their environment (78).

Following an extensive review of the literature, Focht and Koltyn (1999) found decreases in anger and fatigue as compared to baseline values after moderate and high intensity acute bouts of resistance exercise in experienced and inexperienced adult weightlifters. The benefits of exercise in relation to mental health can also indirectly have a positive effect on

physiological parameters, such as blood pressure. Furthermore, these researchers (1999) found that aerobic exercise reduced state anxiety that, in turn, is linked to lowering of the systolic blood pressure (76). All of these beneficial effects of exercise on mental health can serve to improve the perception of quality of life in older adults (73).

Exercise, physical activity and Social Health

Effects of exercise and physical activity on social health have not been well researched. Clark (1996) investigated the relationship between age, socioeconomic status and exercise self-efficacy in a group of inactive, low socioeconomic status, elderly black women. Subjects felt the exercise program was beneficial because they were “getting out”, increasing their social contacts and making new friends. Exercising in a group helped these subjects overcome many barriers via the verbal persuasion and support provided by others. Spirduso and Cronin (2001) also found that physical function was an important predictor of social support by predicting the number of face-to-face contacts and exposure to the number of instrumental support systems for older adults provided by social interaction (75). In another study by Conn (1998), it was found that a high physical activity score reaped the benefit of more social interaction,

thereby positively influencing social health (68). Evans (1998) states that older people often join exercise programs because of the increased opportunity for socialization, not necessarily for the fitness benefits (71). This factor is something that can be capitalized on in setting up exercise programs for seniors.

Another benefit to social health resulting from participation in physical activities is the maintenance of independence (72). Due to a feeling of well-being produced from physical activities, older adults will more likely feel empowered to do things for themselves, live as independently as possible, and interact socially with others. When exercising in a group, older adults will feel a part of a group and form relationships with others, enhancing perception of the social aspect of quality of life. Self-rated health affects older people's life-satisfaction and self-perceptions. Increasing the vitality or slowing down the physical deterioration process can be one effective means of improving the self-perceptions of older adults. Exercise has the capability to accomplish this, as shown by the literature review (79).

Physical Activity and Quality of life

Quality of life is a very complex idea to describe

and a concept not easy to delineate and homogenize in a way that can be applied to all groups within a population (80). Quality of life definitions are abundant and diverse (81). It is seen by societies and people in many different ways and it can be influenced by various factors, including personal perceptions, feelings, culture, education, and religious beliefs (82). Even though there is little agreement about what quality of life means, most experts concede that quality of life is the degree of wellbeing, satisfaction and standard of living (82), and that it can be used interchangeably with other concepts such as well-being, happiness, life satisfaction and the good life (82,83).

In practice, quality of life suggests livability, and it is implicitly understood that a community's quality of life is comprised of the shared characteristics of its residents and their experiences of things such as health, housing, education, traffic, recreational opportunities, water quality, and others (80). In any event what is certain is that "quality of life like beauty, basically lies in the eyes of the beholder" (82), and thus its definition depends to a large degree on who's doing the defining.

Several researchers have stated that quality of

life is a multidimensional concept, a semantic representation that symbolizes ideas and meaning, expresses an abstraction and should be measured by perceptions of the patients (84). The World Health Organization Quality of Life assessment group has proposed that quality of life and the interpretation of quality of life are rooted in the person's culture (85-87). Therefore, the dimensions or domains must be considered within the culture and environment in which they occur.

Quality of life index constructs use different terminologies to refer to the categories by which the index will be formed. Some indices incorporate the term dimensions, domains or categories or categories that identify characteristics deemed essential to any evaluation of quality of life. For purpose of this study the term *categories* will be used to denote categories of the index. These dimensions, domains, categories or categories are at the same time formed by different *indicators.* According to the International Institute for Sustainable Development an indicator quantifies and simplifies phenomena and helps us understand complex realities. At the same time indicators combined and aggregate of raw and processed data as and they can also be aggregated to form complex indices (80). In general terms, indicators are measures

of performance. In turn *indices* are aggregated measures that combine indicators that describe performance.

De Haes and van Knippenberg (1985) noted that the study of quality of life as it relates to health provides a greater understanding of a patient's response to a disease as well as to prescribed treatments. To better address this issue, the concept of quality of life in the context of health and illness is known as health-related quality of life. The term was intended to focus on the impact of health, illness and treatment on quality of life (85). The concept of quality of life was originally used in cancer treatment by nurses and physicians to explain the distinction between the medical and technical components of care and other aspects of patient care (80). When confronted with the suffering of patients directly, they focused on paying more attention to supportive care or quality versus the duration of survival. In this regard, Paxton et al. (2010) investigated the effect of physical activity on quality of life. 196 subjects were evaluated. Results showed that the relationship between physical activity and quality of life was indirect. Accordingly, physical activity influences self-efficacy and this will also increase the quality of life (20). Also, McAuley et al. (2008) examined the physical activity and its impact on quality of life. 249 elderly

people with an average age of 68.1 years old were evaluated and 217 of them were studied for two years. Based on the results, physical activity influences the quality of life indirectly. Physical activity leads to physical and mental health in elderly and this can promote quality of life (21).

In another research, Almeida et al. (2006) investigated aging with high mental health in a longitudinal study. 601 elderly men with age of 65-80 years old were evaluated for 4.8 years. Results showed that physical activity and active lifestyle are important factors associated to high mental health with ageing (36). Barrett et al. (2002) studied the effect of physical activity on physical (flexibility) and psychological (Quality of life) components in elderly. The results showed that physical activity improves quality of life in the elderly (35(.

In the last 30 years, assessment of health-related quality of life has become more relevant in health care particularly in the realm of health and illness, with the patient considered to be an active participant in their care and their choice of treatment options (81). Research conducted on several chronic diseases has emphasized the relevance of evaluating health-related quality of life as part of clinical practice to

determine the effects of medical and community-based interventions (86).

Chapter three: Methodology

Study population

The research population includes 60 years old and above elderly in all the 22 regions of Tehran. According to the latest census conducted in 2011, the elderly population is about 1,102,123 people. Considering the increasing number of elderly population

in later years, the sample will consist of 7500 people.

Sample size

Since no similar study to this research has been conducted in Iran, calculating sample size by estimating the mean or variance of the target population by using sampling formula is not feasible. Thus, the sample size will be calculated according to the idea of biostatistics experts, reference authors in measurement and evaluation and also research literature. The psychometric experts believe that the larger the sample size, the more accurate the estimates of population parameters (23).The general rule in this context confirms the large sample size. Therefore, taking into account the likely increase in the elderly population in later three years, 1500 elderly were selected from each geographic region in total of 7500 subjects.

Sampling method

A multi-stage random sampling procedure was used. For this purpose the city of Tehran will be geographically divided into 5 sections including North, South, East, West and Center. Then one region from each geographical section and three areas from the chosen region were selected by Simple random sampling method. Then, 5 Garden Park were selected randomly of each

selected area. At the end, 100 elderly were recruited according to the inclusion and exclusion criteria. Also, all participants were free to not answer any question.

Study design

In the first step, written permission to use the Physical Activity Questionnaire (IPAQ), Quality of Life Questionnaire (WHOQOL-26) and general health Questionnaire (GHQ-28) will be obtained from the Original authors. Then the questionnaires will be translated to Persian and after coordinating and unifying languages, will be translated into English to match with the original version. This process was conducted according to the IQOLA protocol.

The next step is determining the face validity of the questionnaire and identifying questions with high validity. Three raters for each region will be selected. It is important to mention that all questionnaires will be completed by the elderly. International physical activity questionnaire (IPAQ) will be used to assess physical activity in older adults. The scale evaluates the intensity, duration and frequency of physical activity performed by the person during the last past week. Mental health will be

evaluated by the general health questionnaire (GHQ-28). The questionnaire has four subscales of physical symptoms, anxiety, social dysfunction and depression (42).

The next step is to review the literature and also Preliminary design of the individual characteristics questionnaire according to the needs and objectives of the study. Preliminary tests will be performed by giving the Persian version of the questionnaire to 30 similar individuals of the target group. Finally, after getting permission and Ethical committee code from the sport science research institute , sampling and fieldwork was done. Collected data was analyzed and the final report was presented.

Study setting / data sources

All data in each selected geographic area will be collected by 10 experienced examiners with at least a master's degree in the fields of sports psychology, senior sociology or motor behavior. These individuals will be already taught to interact properly with seniors. All questionnaires will be completed by elderly individuals themselves or by the help of examiners.

Tools

In this research we use 4 questionnaire s for data collection:

1. The International Physical Activity Questionnaire (IPAQ). International physical activity questionnaire will be used to assess physical activity in older adults. The questionnaire evaluates the physical activity performed by a person during the past week. The questionnaire includes activities such as job, how to move, doing housework and leisure time physical activity. These activities will be evaluated based on the MET unit. According to the scoring procedure of the questionnaire, person's amount of physical activity level can be extracted and reported in two ways:

A. The total amount of physical activity in the last week of MET minutes/week

MET is a unit used to estimate energy expenditure and physical activity. All physical activities can be classified as multiples of resting energy consumption. In this questionnaire 3.3 MET for walking, 4 MET for moderate physical activity and 8 MET for vigorous physical activity will be calculated. Total amount of physical activity per week includes the amount of walking (MET × min × day) with moderate amounts of

physical activity (MET × min × day) and the intense physical activity of a person (MET × min × day) during the last week.

B. Classification of Physical activity in three levels: low, moderate and high

high physical activity means that the person has three days of high physical activity per week and at least total of 1500 MET-minute, or 7 days or most days of week has combination of high, moderate and walking which at least has total of 3000 MET- minute. Moderate physical activity means that the person has 20 minutes of high physical activity in three or more days per week, or five or more days per week with at least 30 minutes of intense, moderate or walking activity. Low physical activity means that a person does not report any activity or the reported physical activity is not high or moderate. Validity and reliability of this questionnaire has been determined by Craig et al. (2003) in 12 countries. They reported the reliability and validity of the questionnaire using Cronbach's alpha 0.80 and 0.64 to 0.70 respectively (28). In another study Saglam et al (2010) reported reliability and validity of the questionnaire 0.78 and 0.66 respectively (29). In this study the questionnaire reliability was obtained 0.83 with using Cronbach's

alpha coefficient.

2. Quality of Life Questionnaire (WHOQOL-26):

The short version of the elderly of the World Health Organization Quality of Life Questionnaire (WHOQOL-26) will be used to assess the quality of life. The scale consists of 26 items and four components. Its components include a range of physical, psychological, environmental, and social communication. Trompenaars et al. (2005) reported the reliability and validity of this scale in elderly between 0.66 and 0.80 respectively (38). In other studies Skevington et al. (2004) and Chien et al. (2007) also reported a high level of reliability and validity for this scale (39, 40).). In this study the questionnaire reliability was obtained 0.69 to 0.93 with using Cronbach's alpha coefficient.

3. General Health Questionnaire (GHQ-28):

Geriatric Mental Health will be assessed using General Health Questionnaire 28 questions. The questionnaire has 4 subscales of physical symptoms, anxiety, social dysfunction and depression. Goldberg and Hillier__(1979) reported total and subscales reliability of the questionnaire 0.55 and 0.42 to 0.47

respectively (42). Malakouti et al. (2006) reported The reliability and validity of this scale 0.94 to 0.60 respectively in Iranian elderly aging 74-59 years old (43). In this study the questionnaire reliability was obtained 0.74 to 0.91 with using Cronbach's alpha coefficient.

The Demographic Questionnaire

Demographic Information such as age, sex, socioeconomic status, educational level, specific diseases, surgical history, marital status, number of children of subjects will be collected by this questionnaire.

Ethical Considerations

1. Keeping the confidentiality of participants' personal information and publishing the results in general

2. Using safe practices during the study

3. Obtaining written consent to participate in research

4. Allowing Participants to withdraw from the study at any time

5. Providing preventive or therapeutic services for participants facing problems during the study

Data Analysis

Data was analyzed with using SPSS software. Descriptive statistics were used to describe the mean and standard deviations of variables and demographic characteristics. Inferential statistics such as Pearson correlation coefficient for the relationship between variables, stepwise multivariate regression for determining the prediction ability of the criterion variables by the predictor variables, analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) for determining the differences between the characteristics of mental health, quality of life and their components with different levels of physical activity were used.

Chapter four: Results

This chapter presents the study findings. The demographic description of the sample population such as chronological age, marital status, employment, activities of daily living (ADL), and medications are provided. In addition, the description of research variables such as level of physical activity, mental health, quality of life and its components are presented. The statistical analysis to test of each study hypothesis such as one way ANOVA, MANOVA, Pearson Correlation, and enter linear regression (to test the strength of the predictor variables (level of physical activity) on the two criterion variables (metal health and its components, quality of life and its components) is then presented.

Results of demographic description

Chronological age

Table 1 presents the chronological age for both elderly men and women in each and total regions in Tehran. Based on presented data in this table, the total number of elderly men and women are 4666 and 2834 persons, respectively. Furthermore, the total average chronological age of elderly men and women are, respectively, 73.38±5.25 and 71.47±5.1.

Table 1. Chronological age of elderly in each and total regions

Regions	Number of men	Number of women	Age average in men	Age average in women
North	954	546	74.5±5.5 years old	73.2±6.7 years old
South	840	660	73.1±6.5 years old	70.4±6.1 years old
West	990	510	76.5±5.5 years old	69.5±5.7 years old
East	1002	498	70.5±3.5 years old	71.5±4.3 years old
Center	880	620	72.3±4.5 years old	72.7±3.7 years old
Total	4666	2834	73.38 ± 5.25 years old	71.46 ± 5.1 years old

Marital status

The results of marital status in each and total regions in Tehran presents in table 2. Based on these results, the majority of the subjects were married (70%, *n*=5250), 18% (*n*=1350) were widows or widowers, 10% (n=750) were divorced, and 2% *(n=150)* were single.

Table 2. Marital status of elderly in each and total regions

Regions	Percent and number of married	Percent and number widowers	Percent and number of divorced	Percent and number of single
North	72% (n=1080)	14% (n=210)	12% (n=180)	2% (n=30)
South	70% (n=1050)	17% (n=255)	10% (n=150)	3% (n=45)
West	65% (n=975)	20% (n=300)	13% (n=195)	2% (n=30)

East	73% (n=1095)	17% (n=255)	8% (n=120)	2% (n=30)
Center	70% (n=1050)	22% (n=330)	7% (n=105)	1% (n=15)
Total	70% (n=5250)	18%(n=1350)	10%(n=750)	2%(n=150)

Medications

Medications can have both a positive and negative effect on level of physical activity. The elderly people are often taking several medications at the same time that may have a negative cumulative effect on the desire to physical activity and their physical ability to perform exercise activities. In the subject population, 64.6% *(n=*4845) stated they were currently taking at least one medication for a medical condition. A second medication was taken by 25.4% *(n=1905*) of the subject population, while 4.8% *(n=* 360) were taking a third, 3% *(n=* 325) were taking a fourth medication, and 2.2% (n=165) y weren't taking medication.

Employment

The majority of the sample reported not being currently employed (65.4%, *n=*4905). The remaining subjects (34.6%, *n=*2595) were presently employed in various occupations, ranging from education and health care to sales and self employed. Furthermore, 430 persons of these individuals *(16.57%)* also held a

second job ranging from a self employed or a managerial position.

Activities o f Daily Living

Activities of daily living (ADL) include personal hygiene, dressing, toileting, eating, mobility, and performance of manual tasks, such as pouring a glass of water. Most of the subjects (91.8%, *n* =6885) stated they can do all six of the ADLs independently. Five of the ADL tasks were performed without assistance by 4.2% *(n*=315) of the subjects, 2.6% *(n=195*) was able to do four, 1.2% *(n=90)* performed three independently, and 0.2% *(n*= 15) could only perform two without assistance.

The description of research variables

Level of physical activity

Table 3 presents the description results of the level of physical activity (low, moderate and high) for elderly people in each and total regions in Tehran. Based on presented data in this table, the low, moderate and high levels of physical activity are 74.42%, 15.38%, and 10.2%, respectively. Furthermore, the elderly people of south and north region have highest percents in low (83.94%) and high (14%) levels of physical activity, respectively.

Table 3. level of physical activity in each and total regions

Regions	Low	Moderate	High
North	63% (n=945)	23% (n=345)	14% (n=210)
South	83.94% (n=1259)	9.06% (n=136)	7% (n=105)
West	74% (n=1110)	16% (n=240)	10% (n=150)
East	78.8% (n=1182)	14.2% (n=213)	7% (n=105)
Center	72.4% (n=1086)	14.6% (n=219)	13% (n=195)
Total	74.42% (n=5612)	15.38%(n=1153)	10.2%(n=735)

Mental Health

Table 4 presents the description results of metal health and its components for elderly. Based on presented data in this table, the elderly people of south region have highest scores in somatic symptoms, anxiety and insomnia and social dysfunction components. Furthermore, the elderly people of east region have highest scores in severe depression component. Generally, the elderly people of north and south regions have lowest and highest scores in GHQ-28 total scale, respectively.

Table 4. Mental health and its components in each and total regions

Regio	Somatic	Anxiety	Social	Severe	GHQ-28 total

ns	symptoms	and insomnia	dysfunction	depression	scale
North	15.88±5.42	15.64±5.52	14.76±5.59	16.51±5.71	62.81±17.55
Center	16.47±5.14	15.91±5.96	16.05±5.60	16.19±5.96	64.63±19.33
West	16.48±4.89	16.30±5.57	16.23±5.53	16.05±5.73	65.07±18.38
East	16.80±4.45	16.57±5.28	17.66±5.49	17.29±5.72	67.34±18.40
South	17.06±4.97	17.34±5.06	17.68±5.36	17.21±5.38	69.42±17.07
Total	16.542±5.01	16.35±5.52	16.48±5.62	16.65±5.72	65.85±18.30

Quality of life

Table 5 presents the description results of quality of life and its components for elderly people. Based on presented data in this table, the elderly people of north region have highest scores in physical health, psychological health, social relationships and environmental health components. Furthermore, the elderly people of north region have highest and the elderly people in east region have lowest scores in total score of WHOQOL-26 scale.

Table 5. Quality of life and its components in each and total regions

Regions	Physical health	Psychological health	Social relationships	Health environment	WHOQOL-26 total scale

North	10.27±2.66	10.45±2.64	10.37±2.59	10.88±2.60	41.37±7.96
Center	9.90±2.97	10.30±2.61	10.11±2.75	10.30±2.70	40.62±8.99
West	10.47±2.92	10.20±2.78	10.36±2.83	10.59±3.29	41.13±10.12
East	9.68±2.55	9.58±2.53	9.59±2.48	9.69±2.84	38.55±7.93
South	10.11±2.82	9.96±2.65	9.88±2.50	10.09±2.91	40.05±9.07
Total	10.08±2.47	10.10±2.68	10.06±2.65	10.21±2.90	40.46 ±8.92

Results of Hypothesis Testing

In this section, the following are presented in relation to each study hypothesis: (1) results of statistical procedures to test each hypothesis (Pearson correlation, one-way ANOVA and multiple regression analysis) are presented; (2) and the hypothesis supported or not supported is presented.

Hypothesis 1: There is a significant relationship between levels of physical activity and mental health

in elderly in each and total regions in Tehran.

For evaluate of this hypothesis, we used the Pearson correlation test. Results showed that there is not significant correlation between low level of physical activity and mental health in each and total regions. Furthermore, results showed that there are negative and significant correlations between moderate and high levels of physical education and total score of mental health (table 6). Generally, based on present results the hypothesis was supported.

Table 6. Relationship between level of physical activity and mental health in each and total regions

Level of Physical Activity		Low		Moderate		High	
Region		R	P	R	P	r	P
Mental health	North	-0.052	0.106	-0.182	0.001*	-0.198	0.009*
	Center	-0.018	0.552	-0.168	0.040*	-0.155	0.042*
	West	-0.003	0.910	-0.176	0.006*	-0.171	0.039*
	East	-0.021	0.462	-0.222	0.001*	-0.197	0.045*
	South	-0.002	0.953	-0.221	0.011*	-0.208	0.035*
	Total regions	-0.028	0.073	-0.17	0.038*	-0.157	0.001*

* Significant level at P<0.05

Hypothesis 2: There is a significant relationship between levels of physical activity and quality of life in elderly in each and total regions in Tehran.

For evaluate of this hypothesis, we used the Pearson correlation test. Results showed that there are not significant correlation between low and moderate levels of physical activity and quality of life in each and total regions except north region. Furthermore, results showed that there are positive and significant correlations between high level of physical education and quality of life (table 7). Generally, based on present results the hypothesis was supported.

Table 7. Relationship between level of physical activity and quality of life in each and total regions

Level of Physical Activity		Low		Moderate		High	
Region		R	P	r	P	R	P
Quality of life	North	-0.104	0.011*	0.151	0.027*	0.355	0.001*
	Center	0.056	0.153	0.039	0.563	0.164	0.037*
	West	0.006	0.830	0.086	0.184	0.079	0.553*

	East	0.019	0.511	0.015	0.780	0.185	0.041 *
	South	0.29	0.298	0.034	0.696	0.189	0.039 *
	Total regions	0.003	0.830	0.010	0.725	0.871	0.001 *

* Significant level at P<0.05

Hypothesis 3. Which level of physical activity is more able to predict mental health of elderly in total regions in Tehran?

For evaluate of this hypothesis, we used the linear regression test. Results showed that the high level of physical activity has an effect on mental health in elderly people and was predictor its. This variable can predict 23% of the variance in mental health (P<0.05). On the other words, the low and moderate levels of physical activity cannot predict the variance in mental health (P>0.05). Generally, based on present results the hypothesis was supported.

Table 8. Regression model for high level of physical activity and mental health

Model	SS	Df	Ms	F	P	R	R^2
Regression	1037.111	1	1037.111	16.151	0.001	0.48	0.23
Residual	47069.741	733	64.215				

Variable	B	SE	Beta	T	P
High level of physical activity in total region	-.001	.001	-.147	4.021	0.001*

* Significant level at P<0.05

Hypothesis 4. Which level of physical activity is more able to predict quality of life elderly in total regions in Tehran?

For evaluate of this hypothesis, we used the linear regression test. Results showed that the high level of physical activity has an effect on quality of life in elderly people and was predictor its. This variable can

predict 29.2% of the variance in quality of life (P<0.05). On the other words, the low and moderate levels of physical activity cannot predict the variance in quality of life (P>0.05). Generally, based on present results the hypothesis was supported.

Table 9. Regression model for high level of physical activity and quality of life

Model	SS	df	Ms	F	P	R	R^2
Regression	830.704	1	830.704	7.432	0.007*	0.54	0.292
Residual	81930.181	733	111.774				

Variable	B	SE	Beta	T	P
High level of physical activity in total region	-.001	.002	-.101	2.726	0.001*

* Significant level at P<0.05

Hypothesis 5: There is a significant relationship

between quality of life and mental health of elderly in each and total regions in Tehran.

For evaluate of this hypothesis, we used the Pearson correlation test. Results presented in tables 10 to 15. Based on these results, there are significant and negative correlation between mental health and quality of life in each and total regions of Tehran except severe depression with physical health, psychological health, social relationship and average score of WHOQOL scale, and average score of GHQ-28 scale with psychological health in south region. Generally, based on present results the hypothesis was supported.

Table 10. Relationship between mental health, quality of life and its components in total region

Variables	Physical health		Psychological health		Social relationships		Health environment		WHOQOL-26 total scale	
	r	P	r	P	R	P	R	P	R	P
Somatic symptoms	-0.340	0.002*	-0.362	0.001*	-0.339	0.001*	-0.347	0.002*	-0.426	0.001*
Anxiety and insomnia	-0.361	0.003*	-0.383	0.002*	-0.373	0.002*	-0.364	0.003*	-0.454	0.001*
Social dysfuncti	-0.33	0.005*	-0.37	0.003*	-0.36	0.002*	-0.34	0.004*	-0.43	0.002*

on	7		6		5		3		5	
Severe depression	-0.343	0.007*	-0.369	0.003*	-0.358	0.004*	-0.352	0.006*	-0.436	0.001*
GHQ-28 total scale	-0.409	0.001*	-0.434	0.001*	-0.425	0.001*	-0.416	0.001*	-0.516	0.001*

* Significant level at P<0.05

Table 11. Relationship between mental health, quality of life and its components in north region

Variables	Physical health		Psychological health		Social relationships		Health environment		WHOQOL-26 total scale	
	r	P	r	P	R	P	R	P	R	P
Somatic symptoms	-0.461	0.001*	-0.443	0.001*	-0.473	0.001*	-0.428	0.001*	-0.595	0.001*
Anxiety and insomnia	-0.463	0.001*	-0.471	0.001*	-0.445	0.002*	-0.456	0.001*	-0.604	0.001*
Social dysfunction	-0.372	0.003*	-0.417	0.001*	-0.383	0.003*	-0.337	0.006*	-0.490	0.001*
Severe depression	-0.470	0.001*	-0.471	0.001*	-0.479	0.001*	-0.446	0.001*	-0.615	0.001*
GHQ-28 total scale	-0.560	0.001*	-0.571	0.001*	-0.464	0.001*	-0.528	0.001*	-0.732	0.001*

* Significant level at P<0.05

Table 12. Relationship between mental health, quality of life and its components in center region

Variables	Physical health		Psychological health		Social relationships		Health environment		WHOQOL-26 total scale	
	r	P	r	P	R	P	R	P	R	P
Somatic symptoms	-0.435	0.001*	-0.463	0.001*	-0.431	0.001*	-0.456	0.001*	-0.548	0.001*
Anxiety and insomnia	-0.503	0.001*	-0.530	0.001*	-0.526	0.001*	-0.539	0.001*	-0.644	0.001*
Social dysfunction	-0.486	0.001*	-0.507	0.001*	-0.508	0.001*	-0.513	0.001*	-0.618	0.001*
Severe depression	-0.487	0.001*	-0.523	0.001*	-0.494	0.001*	-0.529	0.001*	-0.623	0.001*
GHQ-28 total scale	-0.562	0.001*	-0.595	0.001*	-0.576	0.001*	-0.599	0.001*	-0.715	0.001*

* Significant level at P<0.05

Table 13. Relationship between mental health, quality of life and its components in west region

Variables	Physical health		Psychological health		Social relationships		Health environment		WHOQOL-26 total scale	
	r	P	r	P	R	P	R	P	R	P
Somatic symptoms	-0.215	0.001*	-0.268	0.001*	-0.229	0.001*	-0.247	0.001*	-0.280	0.001*

Anxiety and insomnia	-0.245	0.001*	-0.276	0.001*	-0.262	0.001*	-0.253	0.001*	-0.302	0.001*
Social dysfunction	-0.259	0.001*	-0.303	0.001*	-0.277	0.001*	-0.233	0.001*	-0.669	0.001*
Severe depression	-0.235	0.001*	-0.276	0.001*	-0.281	0.001*	-0.256	0.001*	-0.306	0.001*
GHQ-28 total scale	-0.283	0.001*	-0.332	0.001*	-0.319	0.001*	-0.306	0.001*	-0.906	0.001*

* Significant level at P<0.05

Table 14. Relationship between mental health, quality of life and its components in east region

Variables	Physical health		Psychological health		Social relationships		Health environment		WHOQOL-26 total scale	
	r	P	r	P	R	P	R	P	R	P
Somatic symptoms	-0.096	0.001*	-0.067	0.001*	-0.035	0.001*	-0.128	0.001*	-0.109	0.001*
Anxiety and insomnia	-0.089	0.001*	-0.090	0.001*	-0.110	0.001*	-0.091	0.001*	-0.124	0.001*
Social dysfunction	-0.081	0.001*	-0.099	0.001*	-0.084	0.001*	-0.091	0.001*	-0.116	0.001*
Severe depression	-0.027	0.001*	-0.032	0.001*	-0.026	0.001*	-0.053	0.001*	-0.046	0.001*
GHQ-28	-	0.001	-	0.00	-	0.001	-	0.001	-	0.001

total scale	0.085	*	0.048	1*	0.077	*	0.104	*	0.106	*

* Significant level at P<0.05

Table 15. Relationship between mental health, quality of life and its components in south region

Variables	Physical health		Psychological health		Social relationships		Health environment		WHOQOL-26 total scale	
	r	P	r	P	R	P	R	P	R	P
Somatic symptoms	-0.096	0.001*	-0.067	0.009*	-0.035	0.179	-0.128	0.001*	-0.109	0.001*
Anxiety and insomnia	-0.089	0.001*	-0.090	0.001*	-0.110	0.001*	-0.091	0.001*	-0.124	0.001*
Social dysfunction	-0.081	0.002*	-0.099	0.001*	-0.084	0.002*	-0.091	0.001*	-0.116	0.001*
Severe depression	-0.027	0.297	-0.032	0.212	-0.026	0.306	-0.053	0.039*	-0.046	0.073
GHQ-28 total scale	-0.085	0.001*	-0.048	0.066	-0.077	0.003*	-0.104	0.001*	-0.105	0.001*

* Significant level at P<0.05

Hypothesis 6. The average score of mental health is

significantly different with levels of physical activity of elderly in each and total regions in Tehran.

For evaluate of this hypothesis, we used the one way ANOVA test. Results showed that difference of mean scores for each and all regions were significant (table 16). Thus, to determine the significant difference in level of physical activity, the schefe post hoc test was used. The schefe post hoc test results are presented in table 17.

Table 16. Results of ANOVA test for mental health and level of physical activity in each and total regions

Regions		SS	Df	MS	F	P
North	Between Groups	366232.798	2	183116.399	2870.093	0.001*
	Within Groups	95510.935	1497	63.802		
	Total	461743.733	1499	------		
Center	Between Groups	463767.715	2	231883.858	3603.132	0.001*
	Within Groups	96341.218	1497	64.356		
	Total	560108.933	1499	------		
West	Between Groups	382536.063	2	191268.032	2309.940	0.001*
	Within	123954.726	1497	82.802		

	Groups					
	Total	506490.789	1499	--------		
East	Between Groups	318790.319	2	159395.159	1263.830	0.001*
	Within Groups	188801.551	1497	126.120		
	Total	507591.869	1499	--------		
South	Between Groups	347079.779	2	173539.890	2882.470	0.001*
	Within Groups	90127.135	1497	60.205		
	Total	437206.914	1499	-------		
Total	Between Groups	1901159.306	2	950579.653	11655.803	0.001*
	Within Groups	611411.824	7497	81.554		
	Total	2512571.130	7499	----------		

* Significant level at P<0.05

The schefe post hoc test results showed that there were significant differences between mental health and levels of physical activity in each and total regions of Tehran. Generally, based on present results the hypothesis was supported.

Table 17. Results of schefe post hoc test in each and total regions

Level of physical activity		Low	Moderate	High
North	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------
Center	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------
West	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------
East	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------
South	Low	--------	0.002*	0.003*
	Moderate	0.002*	--------	0.001*
	High	0.003*	0.001*	--------
Total regions	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*

High	0.001*	0.001*	--------

* Significant level at P<0.05

Hypothesis 7. The average score of quality of life is significantly different with levels of physical activity of elderly in each and total regions in Tehran.

For evaluate of this hypothesis, we used the one way ANOVA test. Results showed that difference of mean scores for each and all regions were significant at the level of P<0.05 (table 18). Thus, to determine the significant difference in level of physical activity, the schefe post hoc test was used. The schefe post hoc test results are presented in table 19.

Table 18. Results of ANOVA test for quality of life and level of physical activity in each and total regions

Regions		SS	Df	MS	F	P
North	Between Groups	63404.700	2	31702.350	1499.373	0.001*
	Within Groups	31652.166	1497	21.144		
	Total	95056.866	1499	--------		
Center	Between Groups	79493.570	2	39746.785	1426.694	0.001*
	Within	41705.477	1497	27.859		

	Groups					
	Total	121199.047	1499			
West	Between Groups	62302.515	2	31151.258	512.453	0.001*
	Within Groups	91000.484	1497	60.789		
	Total	153302.999	1499			
East	Between Groups	28830.100	2	14415.050	328.789	0.001*
	Within Groups	65632.739	1497	43.843		
	Total	94462.839	1499			
South	Between Groups	90615.602	2	45307.801	2072.051	0.001*
	Within Groups	32733.648	1497	21.866		
	Total	123349.250	1499			
Total	Between Groups	261963.687	2	130981.844	2931.660	0.001*
	Within Groups	334953.229	7497	44.678		
	Total	596916.917	7499	-------		

* Significant level at P<0.05

The schefe post hoc test results showed that there were significant differences between mental health and levels of physical activity in each and total regions of Tehran except the low level with high level in east region. Generally, based on present results the hypothesis was supported.

Table 19. Results of schefe post hoc test in each and total regions

Level of physical activity		Low	Moderate	High
North	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------
Center	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------
West	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------
East	Low	--------	0.001*	0.232
	Moderate	0.001*	--------	0.001*
	High	0.232	0.001*	--------
South	Low	--------	0.002*	0.003*
	Moderate	0.002*	--------	0.001*
	High	0.003*	0.001*	--------
Total regions	Low	--------	0.001*	0.001*
	Moderate	0.001*	--------	0.001*
	High	0.001*	0.001*	--------

* Significant level at P<0.05

Hypothesis 8. The average scores of mental health components are significantly different with levels of physical activity of elderly in each region in Tehran.

For evaluate of this hypothesis, we used the Multivariate ANOVA test. Results showed that the difference of main and interaction effects for mental health components for level of physical activity in each and total regions were significant at the level of P<0.05 (table 20). Thus, to determine the significant difference in level of physical activity, the Bonferroni post hoc test was used.

Table 20. Results of Multivariate ANOVA test for mental health components for level of physical activity in each and total regions

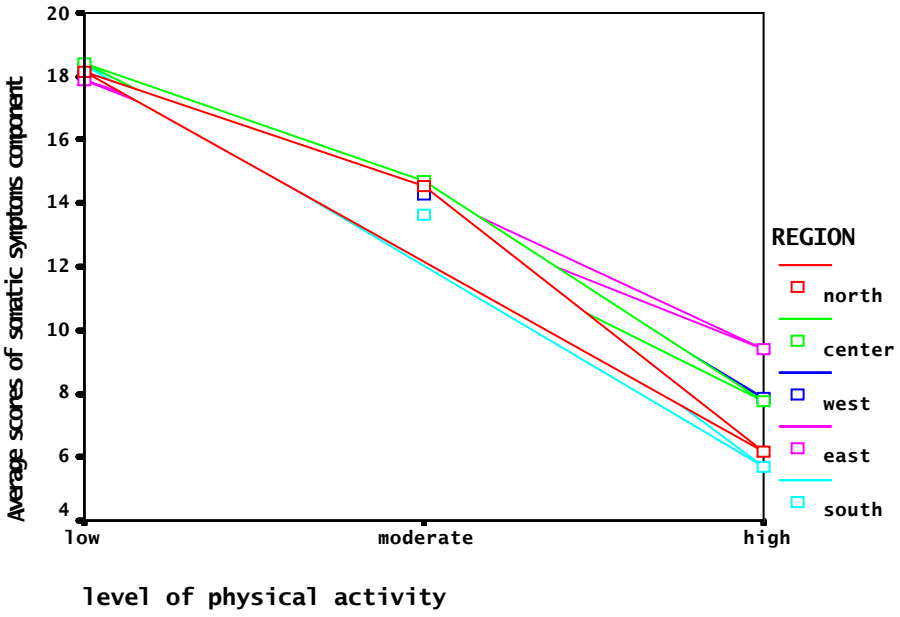
Regions		SS	df	MS	F	P
Level of activity	Somatic symptoms	77844.054	14,7485	38922.02	2812.68	0.001*
	Anxiety and insomnia	126391.58	14,7485	63195.79	5066.34	0.001*
	Social dysfunction	123280.77	14,7485	61640.38	4609.64	0.001*
	Severe depression	135554.92	14,7485	67777.46	4969.02	0.001*
Regions	Somatic symptoms	674.02	4,7485	168.50	12.17	0.001*
	Anxiety and insomnia	507.41	4,7485	126.853	10.17	0.012*
	Social dysfunction	170.78	4,7485	42.69	3.19	0.001*
	Severe depression	1062.83	4,7485	265.70	19.48	0.001*
Activit	Somatic	13611.93	8,7485	151.11	10.920	0.00

y* Regions	symptoms			1		1*
	Anxiety and insomnia	13611.93	8,7485	213.406	17.109	0.001*
	Social dysfunction	13611.93	8,7485	504.942	37.761	0.001*
	Severe depression	13611.93	8,7485	165.486	12.132	0.001*

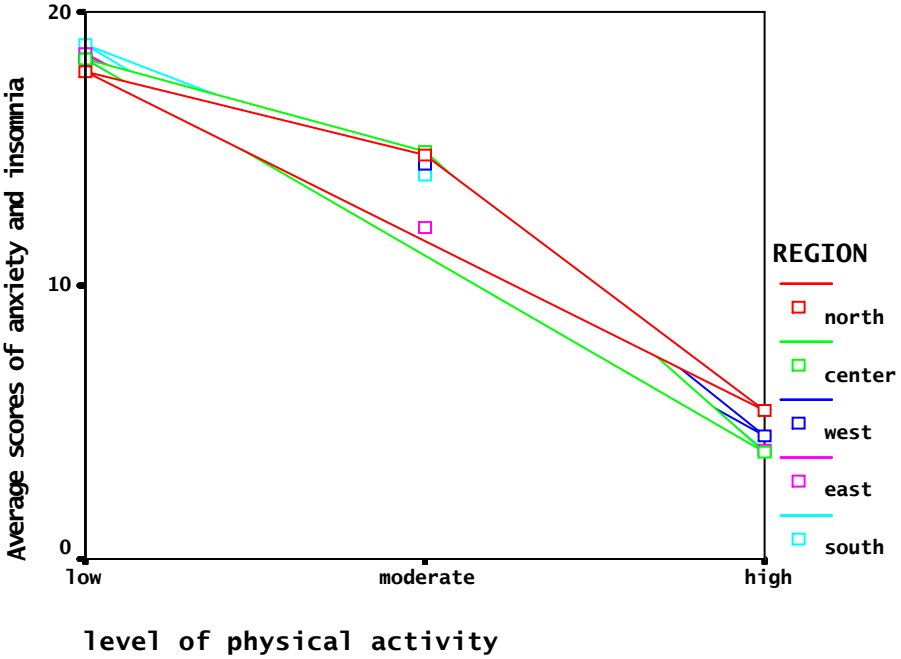
10. * Significant level at P<0.05

Results of multi-factorial analysis of variance showed that the main effect of level of physical activity for mental health components were significant. The Bonferroni post hoc test for pair-wise comparisons showed that there are the significant differences between all mental health components in levels of physical activity (P=0.001). Also, the average scores of mental health components in elderly people with high level of physical activity were better than the elderly people with low and moderate levels of physical activity. Results showed that the main effect of regions for mental health components were significant. The Bonferroni post hoc test for pair-wise comparisons showed that there are significant differences between north region with south and east region, center region with south region, and west region with south region (P=0.001). Also, results showed that the average scores of mental health components on elderly people in north, center and west regions were better than other regions, and north region was better scores than other regions.

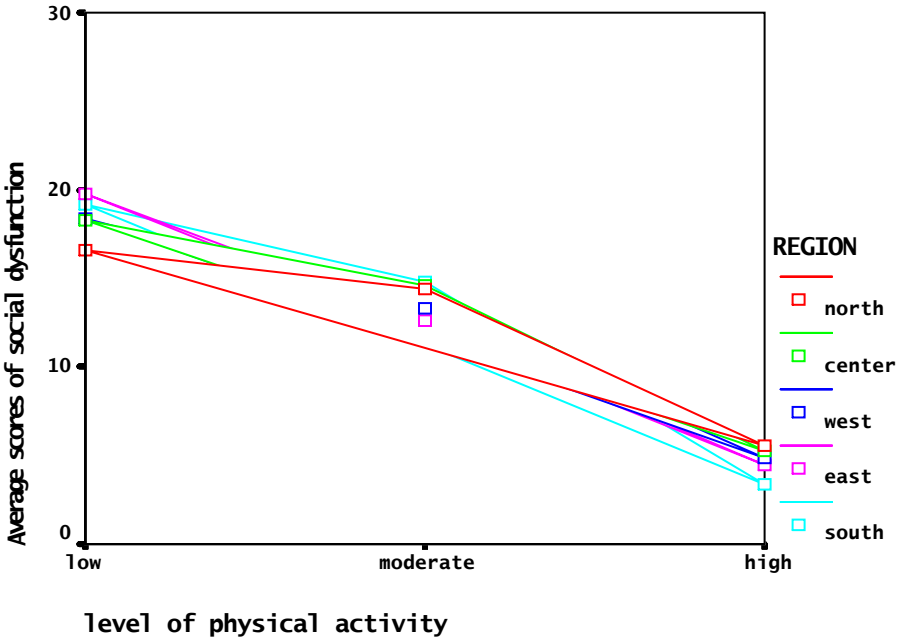
Interactive effect of the level of physical activity and the type of region was significant for all mental health components (P=0.01). The Bonferroni Post hoc test for pair-wise comparisons showed that there are significant differences between north region with south and east region, center region with south region, and west region with south region (P=0.001). The results of interactive effects for mental health components were presented in plots 1-4. These results showed that the elderly people in all regions with high level of physical activity were better in somatic symptoms, anxiety and insomnia, social dysfunction and severe depression components than elderly people with low and moderate levels of physical activity, and its components among elderly people in north and center with high level of physical activity was better that other elderly people. Furthermore, results showed that the elderly people with moderate level of physical activity in all regions were better than the elderly people with low level of physical activity in mental health components (plots 1-4). Generally, b ased on present results the hypothesis was supported.



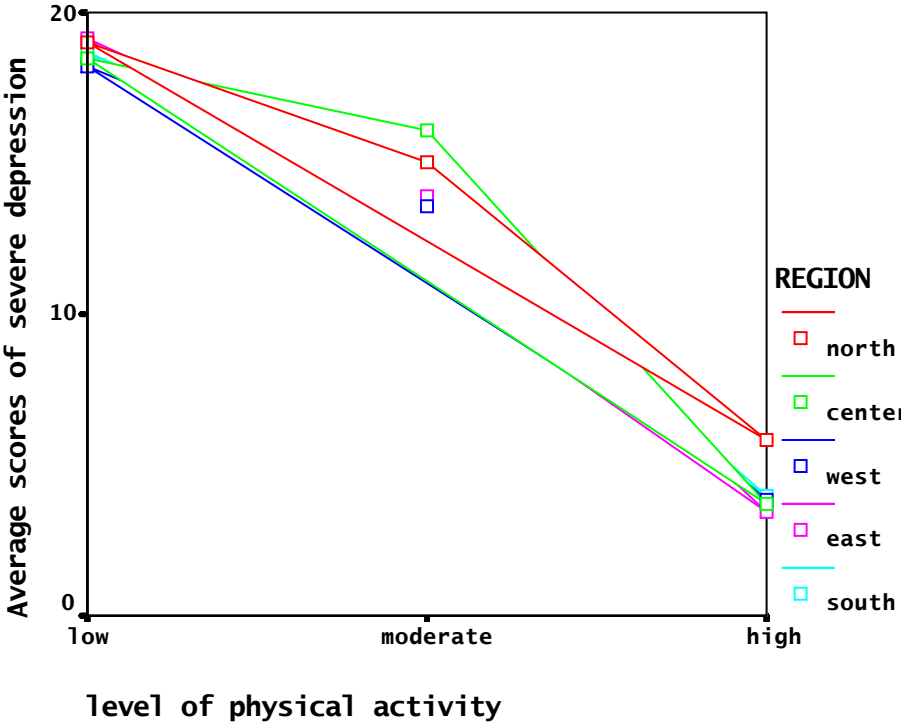
plot 1. Average score of somatic symptoms in levels of physical activity and all regions



plot 2. Average score of anxiety and insomnia in levels of physical activity and regions



plot 3. Average score of social dysfunction in levels of physical activity and regions



plot 4. Average score of severe depression in levels of physical activity and regions

Hypothesis 9. The average scores of quality of life components are significantly different with levels of physical activity of elderly in each region in Tehran.

For evaluate of this hypothesis, we used the Multivariate ANOVA test. Results showed that the difference of main and interaction effects for quality of life components for level of physical activity in each and total regions were significant at the level of P<0.05 (table 21). Thus, to determine the significant difference in level of physical activity, the Bonferroni post hoc test was used.

Table 21. Results of Multivariate ANOVA test for quality of life components for level of physical activity in each and total regions

Regions		SS	df	MS	F	P
Level of activity	Physical health	1612.757	14,7485	403.189	82.211	0.001*
	Psychological health	2133.527	14,7485	533.382	124.483	0.001*
	Social relationships	1610.924	14,7485	402.731	90.923	0.001*
	Health environment	2317.395	14,7485	579.349	111.728	0.001*
Regions	Physical health	14669.012	4,7485	7334.506	1495.519	0.001*
	Psychological health	15654.006	4,7485	7827.003	1826.698	0.012*

	Social relationships	14459.693	4,7485	7229.847	1632.257	0.001*
	Health environment	17935.941	4,7485	8967.971	1729.476	0.001*
Activity * Regions	Physical health	3762.336	8,7485	470.292	95.893	0.001*
	Psychological health	4033.850	8,7485	504.231	117.680	0.001*
	Social relationships	3702.980	8,7485	462.872	104.501	0.001*
	Health environment	5299.820	8,7485	662.478	127.759	0.001*

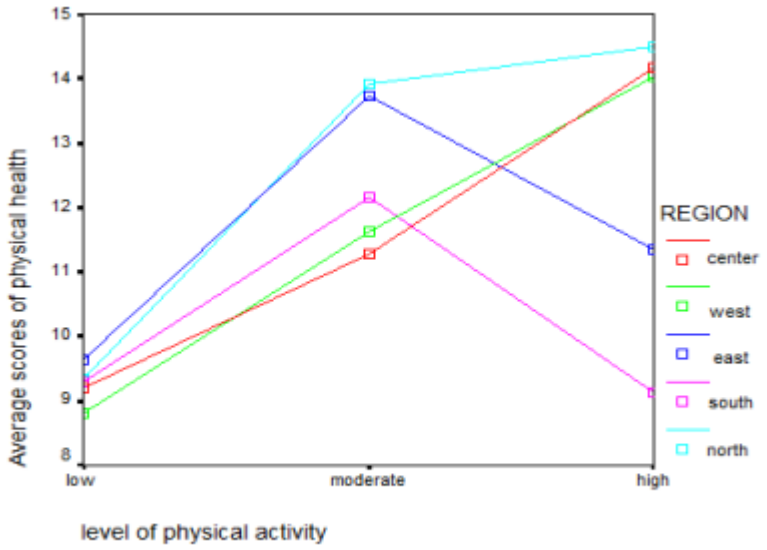
1. * Significant level at P<0.05

Results of multi-factorial analysis of variance showed that the main effect of level of physical activity for quality of life components were significant. The Bonferroni post hoc test for pair-wise comparisons showed that there are the significant differences between all quality of life components in high and low levels of physical activity (P=0.001). Also, the average scores of quality of life components in elderly people with high level of physical activity were better than the elderly people with low level of physical activity. Furthermore, the average scores of quality of life components in elderly people with moderate level of physical activity were better than the elderly people with low level of physical activity.

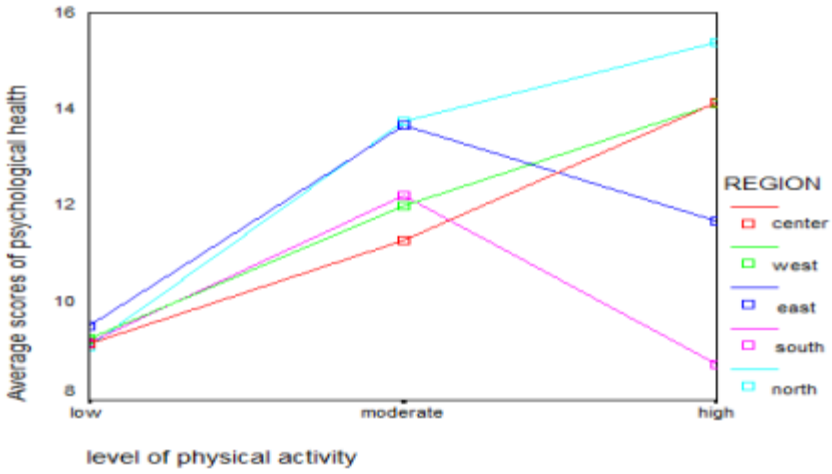
Results showed that the main effect of regions for quality of life components were significant. The Bonferroni post hoc test for pair-wise comparisons showed that there are significant differences between north, center and west regions with south and east region (P=0.001). Also, results showed that the average scores of quality of life components on elderly people in north, center and west regions were better than other regions, and south region was lowest and north region was highest scores than other regions.

Interactive effect of the level of physical activity and the type of region was significant for all quality of life components (P=0.01). The Bonferroni Post hoc test for pair-wise comparisons showed that there are significant differences between north, center and west regions with south and east regions (P=0.001). The results of interactive effects for quality of life components were presented in plots 5-8. These results showed that the elderly people in all regions with high level of physical activity were better in physical health, psychological health, social relationships and health environment components than elderly people with low and moderate levels of physical activity, and its components among elderly people in north, center and west with high level of physical activity was better that other elderly people. Furthermore, results showed

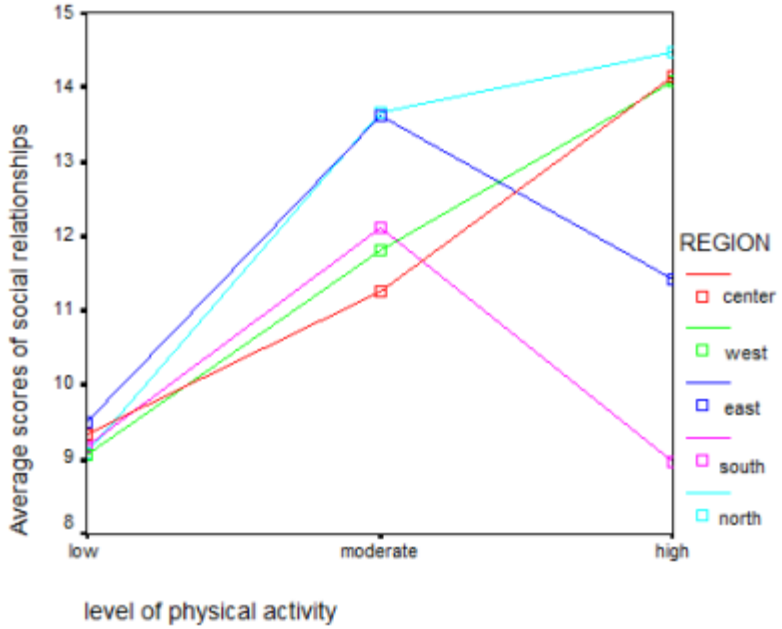
that the elderly people with moderate level of physical activity in all regions were better than the elderly people with low level of physical activity in quality of life components (plots 5-8). Generally, based on present results the hypothesis was supported.



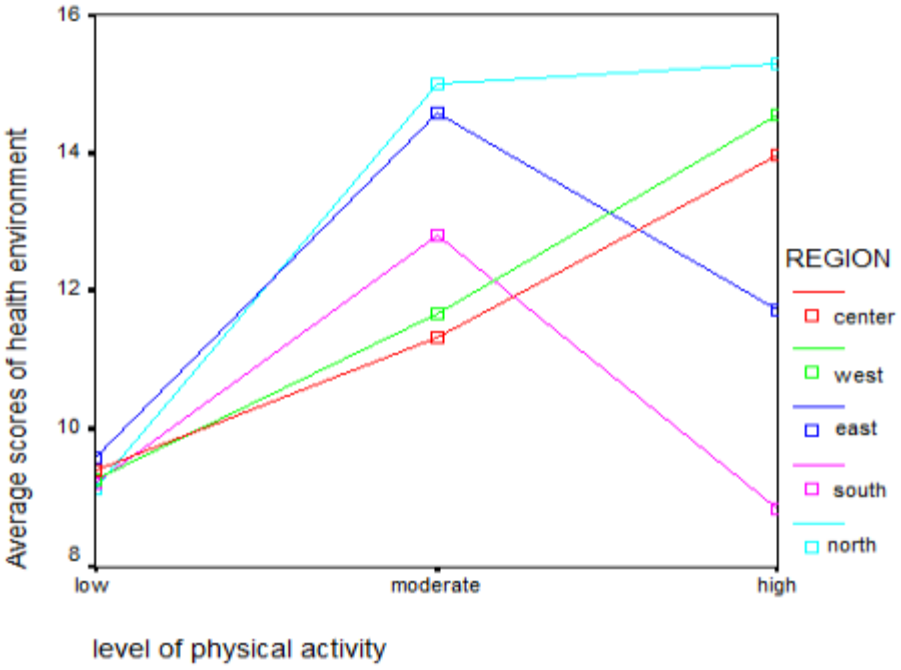
plot 5. Average score of physical health in levels of physical activity and regions



plot 6. Average score of psychological health in levels of physical activity and regions



plot 7. Average score of social relationships in levels of physical activity and regions



plot 8. Average score of health environment in levels of physical activity and regions

Chapter five: Conclusions

In this chapter, the research design and method, data analysis, and the overall study results will be summarized. Furthermore, a conclusion of the findings related to the hypotheses will be presented.

Summary of Research Design, Method and Results

The purpose of this descriptive study was to identify the evaluation of physical activity levels (low, moderate, high) among Iranian elderly and its relationship with mental health and quality of life. The significant differences and correlations between

these variables were investigated. The following research hypotheses were investigated:

1. There is a significant relationship between levels of physical activity and mental health in elderly in each and total regions in Tehran.
2. There is a significant relationship between levels of physical activity and quality of life in elderly in each and total regions in Tehran.
3. Which level of physical activity is more able to predict mental health and its components of elderly in each and total regions in Tehran?
4. Which level of physical activity is more able to predict quality of life and its components of elderly in each and total regions in Tehran?
5. There is a significant relationship between quality of life and mental health of elderly in each and total regions in Tehran.
6. The average score of mental health is significantly different with levels of physical activity of elderly in each and total regions in Tehran.
7. The average score of quality of life is significantly different with levels of physical activity of elderly in each and total regions in Tehran.
8. The average scores of mental health components are significantly different with levels of physical activity of elderly in each region in Tehran.
9. The average score of quality of life components are

significantly different with levels of physical activity of elderly in each region in Tehran.

The research population includes 60 years old and above elderly in all the 22 regions of Tehran. According to the latest census conducted in 2011, the elderly population is about 1,102,123 people. Considering the increasing number of elderly population in later years, the sample will consist of 7500 people. A multi-stage random sampling procedure was used. For this purpose the city of Tehran will be geographically divided into 5 sections including North, South, East, West and Center. Then one region from each geographical section and three areas from the chosen region were selected by simple random sampling method. Then, 5 Garden Park were selected randomly of each selected area. At the end, 100 elderly were recruited according to the inclusion and exclusion criteria. Also, all participants were free to not answer any question.

All data in each selected geographic area will be collected by 10 experienced examiners with at least a master's degree in the fields of sports psychology, senior sociology or motor behavior. These individuals will be already taught to interact properly with seniors. All questionnaires will be completed by elderly individuals themselves or by the help of examiners.

In this research we use 4 questionnaires (the international physical activity questionnaire (IPAQ), quality of life questionnaire (WHOQOL-26), general health questionnaire (GHQ-28) and demographic questionnaire) for data collection.

The descriptive results for number and chronological age showed that the total number of elderly men and women are 4666 and 2834 persons, respectively. Furthermore, the total average chronological age of elderly men and women are, respectively, 73.38±5.25 and 71.47±5.1. The results of marital status showed that the majority of the subjects were married (70%), 18% were widows or widowers, 10% were divorced, and 2% were single. Also, the results of medication showed that 64.6% were currently taking at least one medication. A second medication was taken by 25.4%, while 4.8% were taking a third, 3% were taking a fourth, and 2.2% weren't taking medication . Furthermore, results of employment showed that 65.4% of elderly people reported not being currently employed and 34.6% of subjects were presently employed. In this regards, 430 persons of these individuals (16.57%) also held a second job ranging from a self employed or a managerial position.

Results of The description of research variables

showed that the low, moderate and high levels of physical activity are 74.42%, 15.38%, and 10.2%, respectively. Furthermore, the elderly people of south and north region have highest percents in low (83.94%) and high (14%) levels of physical activity, respectively. Based on presented results about mental health components, the elderly people of south region have highest scores in somatic symptoms, anxiety and insomnia and social dysfunction components. Furthermore, the elderly people of east region have highest scores in severe depression component. Generally, the elderly people of north and south regions have lowest and highest scores in GHQ-28 total scale, respectively.

The description results of quality of life and its components for elderly people. The elderly people of north region have highest scores in physical health, psychological health, social relationships and environmental health components. Furthermore, the elderly people of north region have highest and the elderly people in east region have lowest scores in total score of WHOQOL-26 scale.

Results of Hypothesis Testing

The results of hypothesis 1 (There is a significant

relationship between levels of physical activity and mental health in elderly in each and total regions in Tehran) showed that there is not significant correlation between low level of physical activity and mental health in each and total regions. Furthermore, results showed that there are negative and significant correlations between moderate and high levels of physical education and total score of mental health. This finding supported the literature regarding to relationship between high and moderate levels of physical activity and mental health among elderly people. Bustamante et al. (2013) examined the characteristics of physical activity and depressive symptoms in elderly. In this study, the numbers of 174 persons were completed physical activity and depression questionnaires. Results showed that the moderate or high level of physical activity had significant correlation with depressive symptoms (22). In another research, Kwag et al. (2011) examined the effect of physical activity on mental health of elderly in South Korea. 567 individuals over 65 years old were studied. They found positive correlation between high physical activity level and mental health (33 (. Park et al. (2011) conducted a study on the relationship between physical activity and mental health in people aged 18-64 years old in South Korea. Results showed a positive

relationship between high levels of physical activity and mental health (34). In another study by Conn (1998), it was found that a high physical activity score reaped the benefit of more social interaction, thereby positively influencing social health (68). Evans (1998) states that older people often join exercise programs because of the increased opportunity for socialization, not necessarily for the fitness benefits (71).

The results of hypothesis 2 (There is a significant relationship between levels of physical activity and quality of life in elderly in each and total regions in Tehran) showed that there are not significant correlation between low and moderate levels of physical activity and quality of life in each and total regions except north region. Furthermore, results showed that there are positive and significant correlations between high level of physical education and quality of life. These results supported the literature regarding to relationship between high and moderate levels of physical activity and quality of life among elderly people. In this regards, Paxton et al. (2010) investigated the effect of physical activity on quality of life. In this research, the numbers of 196 subjects were evaluated. Results showed that the relationship between physical activity and quality of life was

indirect. Accordingly, physical activity influences self-efficacy and this will also increase the quality of life (20). On the other hand, in a longitudinal study, McAuley et al. (2008) examined the physical activity and its impact on quality of life. 249 elderly people with an average age of 68.1 years old were evaluated and 217 of them were studied for two years. Based on results of this study, physical activity influences the quality of life indirectly. Physical activity leads to physical and mental health in elderly and this can promote quality of life (21).

The results of hypothesis 3 (Which level of physical activity is more able to predict mental health of elderly in total regions in Tehran?) showed that the high level of physical activity has an effect on mental health in elderly people and was predictor its. This variable can predict 23% of the variance in mental health. On the other words, the low and moderate levels of physical activity cannot predict the variance in mental health. The results of hypothesis 4 (Which level of physical activity is more able to predict quality of life elderly in total regions in Tehran?) showed that the high level of physical activity has an effect on quality of life in elderly people and was predictor its. This variable can predict 29.2% of the variance in quality of life. On the other words, the

low and moderate levels of physical activity cannot predict the variance in quality of life. These findings were supported by the literature. Osness and Mulligan (1998) found an inverse relationship between exercise and depression: the greater the amount of physical activity, the lower the risk for depression and its symptoms (77). The National Institute of Mental Health has called depression among seniors a public health crisis. It is the leading risk factor for suicide in this age group. Depression is a biologically-based illness that can and should be treated (73). Spirduso and Cronin (2001) proposed that frequent exercising may benefit mood in older adults. These investigators found that older adults 60-75 years of age had fewer anxiety and depressive symptoms and higher self-efficacy after they had adopted a new physical activity and maintained it for 6 months. Moderate exercise is one low-cost/ low-risk modality that can help to effectively reduce or eliminate depression in seniors (75). In another study, Barrett et al. (2002) studied the effect of physical activity on physical (flexibility) and psychological (Quality of life) components in elderly. The results showed that physical activity improves quality of life in the elderly and levels of physical activity can predict quality of life (35(.

The results of hypothesis 5 (There is a significant

relationship between quality of life and mental health of elderly in each and total regions in Tehran) showed that there are significant and negative correlation between mental health and quality of life in each and total regions of Tehran except severe depression with physical health, psychological health, social relationship and average score of WHOQOL scale, and average score of GHQ-28 scale with psychological health in south region. Also, the results of hypothesis 6 (The average score of mental health is significantly different with levels of physical activity of elderly in each and total regions in Tehran) showed that difference of mean scores for each and all regions were significant. Also, the schefe post hoc test results showed that there were significant differences between mental health and levels of physical activity in each and total regions of Tehran. Generally, based on present results the hypothesis was supported. The results of hypothesis 7 (The average score of quality of life is significantly different with levels of physical activity of elderly in each and total regions in Tehran) showed that difference of mean scores for each and all regions were significant. The schefe post hoc test results showed that there were significant differences between mental health and levels of physical activity in each and total regions of Tehran

except the low level with high level in east region. These results were supported by the literature that indicted the high and moderate physical activity could be affected mental health and quality of life. In this regard, in a longitudinal study, Almeida et al. (2006) investigated the level of physical activity and mental health among elderly people. 601 elderly men with age range of 65-80 years old were evaluated for 4.8 years. The results of this study showed that physical activity and active lifestyle are important factors associated to high level of mental health with ageing (36).

The results of hypothesis 8 (The average scores of mental health components are significantly different with levels of physical activity of elderly in each region in Tehran) showed that the difference of main and interaction effects for mental health components for level of physical activity in each and total regions were significant. Results of multi-factorial analysis of variance showed that the main effect of level of physical activity for mental health components were significant. The Bonferroni post hoc test showed that there are the significant differences between all mental health components in levels of physical activity. Also, the average scores of mental health components in elderly people with high level of physical activity were better than the elderly people

with low and moderate levels of physical activity. Results showed that the main effect of regions for mental health components were significant. The Bonferroni post hoc test showed that there are significant differences between north region with south and east region, center region with south region, and west region with south region. Interactive effect of the level of physical activity and the type of region was significant for all mental health components. The Bonferroni Post hoc test showed that there are significant differences between north region with south and east region, center region with south region, and west region with south region. These results showed that the elderly people in all regions with high level of physical activity were better in somatic symptoms, anxiety and insomnia, social dysfunction and severe depression components than elderly people with low and moderate levels of physical activity, and its components among elderly people in north and center with high level of physical activity was better that other elderly people. This finding was supported by the literature. The results of this research with the results Siegenthaler (1999), Hilleras et al (2007) is in line (114, 115). They concluded in their research that high levels of physical fitness (physical activity) is reducing anxiety, depression and social

dysfunction in the elderly, and makes mental health, self-esteem, and social skills in elders increase. Also, Griffiths, et al (2014), Motl et al (2005) and Matlabi (2014) Showed that physical activity on mental health index is effective (116, 117,118). Recent studies have also stated that physical activity and exercise, by reducing the fear of falling, improve self-sufficiency and mental health in the elderly to improve strength, balance, muscle function and mental health in the population (119, 120). Also Dechamps et al (2007) and Patil et al (2013) relationship between quality of life, physical activity, health and functionality with the fear of falling in older women with a previous history of falls reported. Because of the possible positive effects of physical activity on mental health can be positively associated with psychological effects such as self-esteem, a sense of hope and self-esteem more, stronger social relationships, ability to adapt and cope with problems which part of it is due to the nature of physical activity and participation in physical activity is obtained (121, 122).

The most important factors that can lead to reduced physical activity and physical fitness of elderly people, is the culture anti-aging. The cause is frustration and lack of adequate access to the elderly. Accordingly, in various countries, particularly older

people, and older women are false labels being sick, weak and unable to eat, and factors such as retirement and the loss of a spouse as a result of financial losses and lack of movement immobility caused and reduce the sense of self efficacy in this class. But fun and refreshing mobility exercise causes the higher stratum of society feel safe living in the community and mental health, their health and quality of life increase.

The results of hypothesis 9) The average scores of quality of life components are significantly different with levels of physical activity of elderly in each region in Tehran) showed that the difference of main and interaction effects for quality of life components for level of physical activity in each and total regions were significant. Results showed that the main effect of level of physical activity for quality of life components were significant. The Bonferroni post hoc test showed that there are the significant differences between all quality of life components in high and low levels of physical activity. Also, the average scores of quality of life components in elderly people with high level of physical activity were better than the elderly people with low level of physical activity. Furthermore, the average scores of quality of life components in elderly people with moderate level

of physical activity were better than the elderly people with low level of physical activity. Results showed that the main effect of regions for quality of life components were significant. The Bonferroni post hoc test showed that there are significant differences between north, center and west regions with south and east region. Also, results showed that the average scores of quality of life components on elderly people in north, center and west regions were better than other regions, and south region was lowest and north region was highest scores than other regions. Interactive effect of the level of physical activity and the type of region was significant for all quality of life components. The Bonferroni Post hoc test showed that there are significant differences between north, center and west regions with south and east regions. Results showed that the elderly people in all regions with high level of physical activity were better in physical health, psychological health, social relationships and health environment components than elderly people with low and moderate levels of physical activity, and its components among elderly people in north, center and west with high level of physical activity was better that other elderly people. These results were supported by the literature. The results of valuable research showed that physical activity (88-

95) and quality of life perception (96, 97,98, 99) has been the subject of numerous studies. This marked interest is probably due to the close association of these aspects with the occurrence and development of outcomes that compromise a good health status (100-104). However, none of these studies has simultaneously employed internationally recognized instruments for the assessment of physical activity and quality of life, a fact impairing generalization of the results due to the specificities of the instruments applied. In addition, studies involving older adults are scarce. To our knowledge, this is the first study conducted on older adults in which two international instruments (IPAQ and WHOQOL -Brief) were applied simultaneously, a fact permitting more reliable conclusions regarding physical activity and quality of life perception.

Consistent with the findings reported in other studies using the IPAQ and identical criteria for interpretation of the data collected (105, 106), the present results indicate a similar physical activity behavior in both north and center regions for subjects ≥ 60 years despite a discretely higher proportion of sedentary people. In the present sample of elderly people the proportion of physical inactivity was higher than that reported in other Brazilian (91), North American (90) and European (95,93) studies. The reasons

for these differences are not completely understood. Methodological differences between studies in terms of sample selection and of the stratification of older adults according to age may explain, in part, the differences identified. In addition, socio cultural, structural, and environmental factors may contribute to the identification of differences in physical activity levels between older adults from different regions of the world.

In the present study, analysis of quality of life perception revealed significant differences between mean scores obtained for the domains of the WHOQol-Old module, a finding demonstrating the multidimensional concept of quality of life and suggesting the separate analysis of each. This tendency agrees with data reported in the multicenter study originally conducted for the development of the WHOQol-Old module domain (106) and with other studies investigating quality of life in older adults (97, 108). The mean scores obtained for the four quality of life domains in north, center and west region are higher than south and east region of Tehran. In this particular case, evidence suggests that the perception of quality of life is affected by physiological, social, cognitive, and emotional attributes, with aging affecting one or more of these attributes to a greater or lesser extent

depending on the context in which the older individual is inserted (108). In the case of the present sample, the more advanced regional development observed in the north region of Tehran may have led to a better quality of life of older adults compared to those from the northeastern region of Tehran. An important finding of the present study was that higher levels of physical activity were associated with higher quality of life scores. However, one may speculate that the favorable influence of physical activity on quality of life might be confused with the concomitant impact of other socio demographic variables, such as age, marital status, educational level, and family socioeconomic status. This finding is consistent with previous studies using other assessment instruments to monitor physical activity and quality of life (88,108).

The present results also demonstrated that higher levels of physical activity did equally influence the four quality of life domains proposed in the WHOQol-Old module. On the other hand, the mean scores obtained for the physical health, psychological health, social relationships, health environment domains were significantly higher among physically active older adults compared to older adults with low and moderate levels of physical activity. Also mean scores for the physical health, psychological health, social

relationships, health environment domains did not differ significantly between the low levels of physical activity in different region.

These findings agree with the results of intervention studies, which demonstrated improvement in the perception of quality of life in domains related to functional capacity, independence, and interpersonal relations when increasing the level of physical activity of older adults by submitting them to systematic physical exercise programs (100). Few studies investigated the relationship between PA and QoL considering various PA contexts. Jurakic et al (2010) assessing QoL with the SF-36 questionnaire, observed that leisure PA was associated with vitality and mental health domains among women, and with vitality and bodily pain among men (109,110). However, transport PA was inversely associated with QoL (physical domain in women and physical domain, bodily pain, social and physical component in men). The authors believe that the negative results of transport PA re*ect the low importance given to walking for transportation as a way to provide health bene*ts. On the other hand, positive associations between leisure PA and general QOL (109), physical (110), psychological (111) and environment (112) domains have been reported, which con*rm the *ndings from this study (113).

Totally, results of this study showed that regular physical activity with high level can relieve tension, anxiety, depression and anger. You may notice a "feel good sensation" immediately following your physical activity, and most people also note an improvement in general well-being over time as physical activity becomes a part of their routine. Too much sitting and other sedentary activities can increase your risk of cardiovascular disease. One study showed that adults who watch more than 4 hours of television a day had a 46% increased risk of death from any cause and an 80% increased risk of death from cardiovascular disease. Without regular physical activity, the body slowly loses its strength, stamina and ability to function well. People who are physically active and at a healthy weight live about 7 years longer than those who are not active and are obese. Becoming more active can help lower your blood pressure and also boost your levels of good cholesterol. The results of the present study should be interpreted in view of some limitations. First, the IPAQ is a retrospective instrument of self-recall of daily activities performed in the week preceding its application. Although the psychometric indications of the questionnaire are available and meet the acceptance criteria proposed (Craig et al., 2003), there is the possibility of seasonal influences that

may interfere with the identification of physical activity.

Second, the reports provided by the older adults of the present sample indicate that selfperception of quality of life reflects individual responses that exclusively depend on attitudes toward different surrounding situations. Thus, since the sample consisted of older adults with a wide diversity of life experiences, the possibility of eventual bias in the interpretation of the questions of the WHOQOL cannot be ruled out. In generally, the significant finding of the present study was the different quality of life perception of older adults according to the level of physical activity. Physically more active subjects presented better quality of life perception than their low peers, a finding confirming the hypothesis that perception of quality of life is associated with physical activity. Despite methodological difficulties in designing studies with this purpose, a better understanding of the complex dose-response relationship between physical activity and quality of life is important to propose recommendations addressing lifestyle changes in older adults, especially those who are still not affected by debilitating diseases and are physically independent.

Also, results showed that the total quality of life

score and component scores of physical factors, self-care, anxiety and depression, social, psychological, sexual and life satisfaction is higher among the active elderly woman. The results obtained in this research with results of Becker and Tenenbaum (2005); Hegbom, et al (2007) ; Maculey (2005); Matlabi (2014) ; langlois, et al (2013); and Brown, et al (2014) were similar (116, 123-127). Their researches showed that exercise has a positive effect on the quality of life of older people. Because of the possible positive effects of physical activity on quality of life can be that physical activity reduces the activity limitations, more independent, happy and successful life and the increasing role and thus lead to increased quality of life and sense of well-being in the elderly (116). Therefore, it can be deduced that the elderly with lower mental health and lower quality of life by addressing physical activity as an environmental experience can somehow ease their personality conflicts and achieve better mental and social growth find (128). Kokkonen, et al (2001) and Maculey (2005) also suggests that physical activity reduces the withdrawn, somatic complaints, depression and mental disorders and quality of life and life expectancy is increasing (129,126).

Conclusion

According to the results of previous studies and the results of this study showed that physical activity and sport participation teaser is one of the important factors that modulate the unfortunate crises at all stages of human development and solidarity and to strengthen the personality characteristics, mental health, physical, social adjustment (116,129) and improving the quality of life of the elderly (122). Thus, with the support of physical activity programs, promotion and advertising its anti-aging effects can be helped to have a health community.

As the results of research studies show physical activity, sports and entertainment, happy and satisfying life for seniors creates. It is recommended to design appropriate strategies for exercise and physical activity, especially the activity of mass at the center of activity for the elderly, elderly care centers, complexes, parks and public places as a factor for increasing the spirit of modernity and diversity of desire, hope and confidence future mass participation and group work used in the elderly, in order to meet the needs and expectations of the elderly (legal aspects) and benefit the quality of life of older people in economic, social, health, physical, psychological, cultural and They contribute to the development of the country, to the needs of civil

society in the fields of reconstruction and eradication of poverty in the aspects of cultural, social and economic (aspects of responsibility) should be considered.

Acknowledgment: The authors express their thanks to the questioners and seniors participated in this study for patience and also expressed confidence the researcher. We hope that the results of this study may help older people to live better society.

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