THE EFFECT OF 8 WEEKS STEP-AEROBİC EXERCİSE PROGRAM ON BODY COMPOSİTİON AND QUALİTY OF LİFE OF SEDANTERY WOMEN

ENGİZN GEZER[1], EVRİM ÇAKMAKÇI[2]
[1]Mustafa Kemal University, Higher School of Physical Education and Sports, Hatay/TURKEY
[2]Selçuk University, Higher School of Physical Education and Sports, Konya/TURKEY
Email: egezer@gmail.com

Abstract
Objective: The purpose of this study was to determine the effects of 8 weeks step-aerobic exercise program on body composition and quality of life of sedantery women.
Material: 70 women volunters (age 35,1 ± 9,11, weight 68,55 ± 6,72, height 160,59 ± 5,20) with stable general health were included into this study. Their quality of life was assessed by World Health Organization's Turkish version of WHOQOL-BREF scale. Also to understand the body composition of the women; flexibility, body fat percentage, body weight and body height were assessed. As statistical anlysis of datas, were done by t test and ANOVA test ($p < 0.05$) for understand relation between body composition and quality of life areas.
Method: During 8 weeks , women participated ina step-aerobic exercise program during 30 minutes and 3 times per week. Before the exercise program and at the end of the program measurements of flexibility, body fat percentage, body weight, body height and the scale of quality of life were assessed.
Result: According to the analysis, the general results of the present study indicated that there was a significant relationship between the body composition and quality of life areas, especially body fat percentage.
Key Words: Sedantery Women, Step-Aerobic Exercise Program, Body Composition, Quality of Life,

---

Introductions

Quality of life is a complex concept. It conjures up pleasant notions of how people want to be and how they want to live. Unfortunately, it is extremely difficult to define quality of living. Its uses vary between individuals, though each individual rarely discloses what is meant by the phrase. As a concept, quality of life is open to a myriad of ideological uses, as well as potential abuses (G.A. Meeberg, 1993, M. Edlund, L.R. Tancredi, 1985).

Quality of life is commonly measured with a complex collection of items, scales, domains, and instruments. The general concept of quality of life was initially considered a useful adjunct to traditional concepts of health and functional status. An ideal health assessment, therefore, should include a measure of a person's physical health; a measure of physical, social, and psychological functioning; and a measure of quality of life. Such an assessment should cover key physical, psychological, social, and spiritual domains of life (T.M. Gill, A.R. Feinstein 1994, The WHOQOL Group 1998).Quality of life was defined by the World Health Organization Quality of Life (WHOQOL) Group as "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." It is a broad ranging concept affecting a persons' physical health, psychological state, level of independence, social relationships, and relationships with salient features of his or her environment (The WHOQOL Group 1993, The WHOQOL Group 1995).Questionnaires are commonly used to measure quality of life since a person's quality of life is best explained from a personallevel (A. Bowling et al, 2002). Many inventories have been developed and used for this purpose (R.T. Anderson et al, 1993, X.T. Zhang et al, 2005).The Brief Version of The World Health Organization's Quality of Life Questionnaire (WHOQOL - BREF) is a useful alternative and is considered as reliable as other instruments (R.E. O'Carroll et al 2000, P. Dündar et al, 2002). This instrument produces internal consistency, discriminate validity, criterion validity, concurrent validity, and test-retest reliability (The WHOQOL Group 1998). The WHOQOL-BREF is most useful in studies that require a brief assessment of quality of life. For example, it is most beneficial in large epidemiological studies. However, it has rarely been used among elderly people without specific illnesses (M.R. Lin et al, 2002) and, according to a search of past studies, a study related to the subject has never been conducted in Turkey. In Turkey, professional homecare foundations and professionals for elderly people are insufficient and rare. Therefore, older people without access to family caregivers or who are incapable of self-care tend to live in assisted living facilities. In this study, the aim was to use the WHOQOLBREF to assess and compare health related quality of life in elderly people who live at home and elderly people who live in elderly assisted living facilities. (S. Bodur, C.D. Dayanır, 2009).Exercise improves mood and QOL by increasing overall health through socialization, goal setting, participation, decreased body weight, or decreased fatigue (J. Midtgaard et al, 2006). The quality of life (QOL) reflects how a person takes his or her position in the world in the context of culture and value systems in which they live, and in relation to their aims, expectations, lifestyle, and interests (E. Dragomirecka, C. Skoda, 1997). Even if correlation between increased performance and improved quality of life can be expected, this relation is not obvious.

Materıal

The choice of subjects

70 sedantery women whose mean age was: 35.10 ± 9.11 years, mean height: 160,59 ± 5.20 cm and average body weight (BW) was : 68.55 ± 6.72 kg, taking part in the step aerobic exercise program run by KOMEK (Konya Vocational Course) were included in the study.

The subjects were informed about the parameters and their written consents were obtained and then examined physically. The completely healthy individuals who had no diabetic, cardiac and chronic systemic and metabolism diseases, and the diseases affecting immune functions in their clinical examinations and history were included in the study. The subjects were asked to follow their usual normal nutrition habits and to avoid excessive physical activities during the study.

Metod

We had the subjects do warm-up exercises for 10 minutes, active step aerobic exercises for 45 min. and finally stretching cooling exercises for 10 min. at the 60-70% severity of their target pulse rate three days a week for 8 weeks, and the rates before and after the exercises were recorded. The severity of the aerobic exercise was determined according to Karvonen protocol. Pulse Rate (PR)= 60-70% PR(PR max-PR min)+PR

Maximal PR=220- age (K. Özer, 2006).

Measuring/measurement means:

Before the subjects started training, the initial tests and at the end of the training after 8 weeks the final tests of height(H), body weight(BW), systolic blood pressure (SBP), diastolic blood pressure (DBP), body fat percentage (BFP), waist and hip rate (WHR), elasticity (E), body mass index(BMI) and WHOQOL-BREF Turkish version were obtained and recorded.

Anthropometric Measurements:

The body weights of the individuals included in the study were measured in kilogram (kg) with NAN scale in their casual home clothes with bare feet before the exercises began. Their heights were measured in meters with studio meter and recorded. Body mass index (BMI) was calculated with Weight / height² (kg/m^2) formula. The contour of the body was measured in cm. with a fiberglass tape measure which is 0.6cm wide, rigid but flexible. The steps taken during the measurements were mentioned below.

Waist circumference was measured horizontally from the narrowest point of the distance between ksifoid prominence and umbilicus, and hip circumference was measured from the trochanters horizontally as the widest diameter while the legs were 20-30cm apart. Moreover, the values of waist and hip circumferences were divided to each other and waist/hip rat was obtained. The thickness of skin pleat was measured from triceps, biceps, subscapular and suprailiac zones using Holtain T/W Skinfold Caliper. In order to measure the thickness of the skin pleat, the fold between thumb and index finger was separated from the muscular tissue removing the skin with its hypodermic fat tissues and slightly compressing it between the ends of caliper and the values on the dial was read and recorded.

Total Body Fat Percentage:

Body density was calculated using Durnin-Womersley formula with triceps, biceps, subscapular and suprailiac SF Total body fat percentage was calculated applying Siri equation to this body density.

Durnin-Womersley Formulas:

Female=1,1581- (0,0720x(LOG□□ (triceps, biceps, subscapular and suprailiac SF) (J.V. Durnin and J. Womersley, 1974)

Total Body Fat Percentage= (4.95/body density - 4.50) x 100 Siri (N.E. Siri, 1956)

Blood Pressures: the SBP and DBP of the subjects were taken in mmHg with stethoscope and sphygmomanometer (B.N. Roohi, 2008).

Sit and Reach Test was used to measure the elasticity of the individuals. The test was repeated twice and the highest score was recorded (K. Tamer, 2000).

Measuring the quality of life: WHOQOL-BREF Turkish version was used to measure the life quality of the individuals. The test was used before and at the end of 8 weeks.

Statistic Analyzes: The arithmetic means and standard deviations of all statistical data in the study were calculated with SPSS 15.0 packet program. The comparison of test assessments of the subjects with each other before the training and after 8-week training was performed with Paired Samples t-test.

Results

Table 1:

	Mean	Std. Deviation	T	P
Age (year)	**35.10**	**9.11**		
Height(cm)	**160.59**	**5.20**		
BW(kğ)1	**68.55**	**6.727**	**7.376**	**.000***
BW 2	**66.00**	**6.164**		
BMI 1 (kg/m2)	**26.57**	**2.257**	**7.502**	**.000***
BMI 2 (kg/m2)	**25.58**	**2.027**		
WHR 1(%)	**,7919**	**,05723**	**2,092**	**,046***
WHR2 (%)	**,7744**	**,04781**		
BFP1(%)	**36.12**	**2.739**	**5.448**	**.000***
BFP 2 (%)	**33.41**	**3.772**		
Elasticity (cm)1	**28.90**	**5.492**	**-2.727**	**.011***
Elasticity(cm2	**30.07**	**5.675**		

In Table 1, according to the values of first and last tests of the subjects, there was significant difference in the parameters of BW, BMI, WHR, BFP, E, respectively in favor of the last tests (Table: 1 P<0.05*)

Table2:

	Mean	Std. Deviation	T	P
Age (year)	**35.10**	**9.11**		
Height(cm)	**160.59**	**5.20**		
Percieved General Life Quality 1	**3.05**	**0.95**	**0.772**	**.020***
Percieved General Life Quality 2	**3.80**	**0.86**		
Percieved Health Condition 1	**3.25**	**0.83**	**0.574**	**.020***
Percieved Health Condition 2	**3.90**	**0.85**		
Pysical Health 1	**11.88**	**1.17**	**2.580**	**.015***
Pysical Health 2	**14.15**	**1.54**		
Psychological 1	**10.95**	**3.69**	**1.457**	**.000***
Psychological 2	**12.54**	**3.25**		
Social 1	**11.14**	**2.26**	**0.859**	**.124**
Social 2	**11.21**	**2.38**		
Envorinment 1	**11.50**	**2.01**	**0.965**	**.094**
Envorinment 2	**12.01**	**2.15**		

In Table 2, according to the values of first and last tests of the subjects, there was significant difference in the parameters of PGLQ, PHQ, PH, P respectively in favor of the last tests (Table: 2 P<0.05*)

Discussion

Exercise improves mood and QOL by increasing overall health through socialization, goal setting, participation, decreased body weight, or decreased fatigue (M. Edlund, L.R. Tancredi, 1985, T.M. Gill, A.R. Feinstein, 1994).

As many issues contribute to decreased QOL, our review examined solely exercise interventions to improve overall QOL in women. McNeely et al. (The WHOQOL Group 1998) examined the effect of exercise primarily on QOL, physical functioning or cardiorespiratory fitness and secondarily on fatigue and body composition in women, whereas our review focused solely on QOL and body composition.

Physical exercises performed regularly have effects on obesity,cardiovascular system, blood pressure, physical fitness, body fat rate and healthy life of the middle-aged individuals (D.E. Laaksonen et al, 2002; A.S. Ryan et al, 1996; I.S. Ockene et al. 2004; G. Charach et al. 2004).

B.N. Roohi et al. (2008) found in a study carried out on 37 females that BFP was 28.68 ± 5.33 kg and BMI was 26.59 ± 4.02 kg. M. Egana and B. Done (2004) applied (n=7) treadmill, n=(8) elliptical and n=(7) stepper exercises on 24 females for 12 weeks and the groups were given BFP and BW pre tests before starting exercises and they found that the rate of the BFP in the last tests was significantly different in favor of the last tests. I.S. Ockene et al. (2004) found no statistically significant difference in the values of BFP, and E of the sedentary males after 6-week aerobic exercises.

F.F. Çolakoğlu and S. Karacan (2006) applied 30 min run-walk training program 3 days a week for 12 weeks and established that the results of BMI and BW in the first and last tests before and after 12 weeks were significantly different in favor of the last tests.

M.E. Kafkas et al. (2009) are of the opinion that12-week regular aerobic and stress exercises have positive effects on BW, BMI, BFP, WHR and blood pressure. Pressue et al. (1997) have found in their study carried out on 97 sedentary male-female subjects that regular aerobic exercises have positive effects on BMI and BFP. E. Zorba et al. (2000) established significant increase in the values of elasticity after the exercises performed 45 min 3 days a week for 8 weeks in the middle-aged sedentary females.

In this study, it has been determined that there is significant difference (p<0.05) between the tests of BW, BFP, BMI, WHR, SBP and DBP given after 8-week aerobic-step exercise protocol in favor of the last test. We too have demonstrated in this study that

exercises have affected positively BW, BFP, BMI and WHR compatible with other studies.

References

ANDERSON, R.T., ARONSON, N.K., WİLKİN, D., 1993, *Critical Review Of The İnternational Assessments Of Health-Related Quality Of Life.* Qual Life Res;2.369–395.

BODUR, S., DAYANIR, C.D., 2009, *Usıng WHOQOL-BREF To Evaluate Qualıty Of Lıfe Among Turkısh Elders In Dıfferent Resıdentıal Envıronments.* The Journal of Nutrition, Health & Aging Volume 13, Number 7

BOWLİNG, A., BANİSTER, D., SUTTON, S., EVANS, O., WİNDSOR, J.A., 2002, *Multidimensional Model Of The Quality Of Life İn Older Age.* Aging & Mental Health;6.355–371.

CHARACH, G., RABİNOVİCH, PD., WEİNTRAUB, M., 2004, Seasonal changes in blood pressure and frequency of related complications in elderly Israeli patients with essential hypertension. Gerontology, 50:315-21

ÇOLAKOĞLU, F.F., KARACAN, S., 2006, Genç bayanlar ile orta yaş bayanlarda aerobik egzersizin bazı fizyolojik parametrelere etkisi. Kastamonu Eğitim Dergisi, 14(1): 277–284,

DRAGOMİRECKA, E., SKODA, C., 1997, Kvalita zivota. Quality of life. Specification, definition, and historical development of the concept in social psychiatry. Cs Psychiatrie; 93 (2): 102–108.

DURNİN, J.V., WOMERSLY, J.,1974, *Body Fat Assesed From Total Body Density And İts Estimasion From Skinfold Tickness:* Measurements On 481 Men And Women Aded From 16 To 72 Years. Br J Nutr 1974;32:77-97.

DÜNDAR, P., FİDANER, C., FİDANER, H., ORAL, A., ESER, S., ATMAN, U.C., PALA, T., 2002, *Comparing The Turkish Versions Of WHOQOL-BREF And SF-36: Convergent Validity Of WHOQOLBREF And SF-36.* Hippokratia;6(Suppl. 1):37-43.

EDLUND, M., TANCREDİ, L.R., *Quality Of Life: An İdeological Critique.* Perspect Biol Med;28: 591–607.

EGANA, M., DONE, B., 2004, *Physiological changes following a 12 week gym based stair-climbing, elliptical trainer and treadmill running program in female.* J Sports Med Phys Fitness, 44: 141–146,

GİLL, T.M., FEİNSTEİN, A.R., 1994, *A Critical Appraisal Of The Quality Of Quality Of Life Measurements.* JAMA;272:619-626.

KAFKAS, M.E., AÇAK, M., KARADEMİR, T., 2009, *12 Haftalık Düzenli Aerobik Ve Direnç Egzersizlerinin Orta Yaş Erkek Ve Kadınların Vücut Kompozisyonları Üzerine Etkisi* , Niğde Üniversitesi Beden Eğitimi Ve Spor Bilimleri Dergisi Cilt 3, Sayı 3

LAAKSONEN, D.E., LAKA, H.M., SALONEN, J.T., NİSKANEN, L.K., RAURAMAM, R., LAKKA, T.A., 2002, *Low levels of leisure-time physical activity and cardiorespiratory fitness predict developmen of the metabolic syndrome*, Diabetes Care. 25:1612-1618,

LİN M.R., HUANG, W., HUANG, C., HWANG, H.F., TSAİ, L.W., CHİU, Y.N., 2002, *The İmpact Of The Chichi Earthquake On Quality Of Life Among Elderly Survivors İn Taiwan- A Before And After Study.* Qual Life Res;11:379-388.

MEEBERG, G.A., 1985, *Quality Of Life: A Concept Analysis.* J Advan Nurs 1993;18:32-38.

MİDTGAARD, J., RORTH, M., STELTER, R., ADAMSEN, L., 2006, The group matters: an explorative study of group cohesion and quality of life in cancer patients participating in physical exercise intervention during treatment. Eur J Cancer Care;15:25–33.

O'CARROLL, R.E., SMİTH, K., COUSTON, M., et al, 2000 *A Comparison Of The WHOQOL-100 And The WHOQOL-BREF İn Detecting Change İn Quality Of Life Following Liver Transplantation.* Qual Life Res;9:121-124.

OCKENE, IS., CHİRİBOGA, DE., STANEK, E.J., 2004, *Seasonal variation in serum cholesterol levels:Treatment implications and possible mechanisms.* ArchIntern Med, 164:863-70

ÖZER, K., 2001, *Fiziksel uygunluk*. Nobel Yayın Dağıtım, Ankara,

ROOHİ, BN., 2008, *BMI, Fat Percentage And* VO_{2max} *İn College Female Staff. J Sports* Med Phys Fitness, 48(11): 211-216.

RYAN, AS., PRATLEY, RE., GOLDBERG, AP., ELAHİ D., 1996 , *Resistive training increases insulin action in postmenopausal women.* J Gerontol Med Sci. 51A:M199-M205,

SIRI, NE., **1956,** *Advances in biological and medical physics.* Lawrence JH, Tobias CA, editors. London and New York: Academic Press; 1956.

TAMER, K., 2000, Sporda *Fiziksel Fizyolojik Değerlendirilmesi*. Bağırgan Yayımevi, S.140, Ankara

THE WHOQOL GROUP., 1993, *Study Protocol For The World Health Organization Project Develop A Quality Of Life Assessment İnstrument (WHOQOL).* Qual Life Res;2:153-159.

THE WHOQOL GROUP., 1995, *The World Health Organization Quality Of Life Assessment (WHOQOL): Position Paper From The World Health Organization.* Soc Sci Med;41:1403-1409.

THE WHOQOL GROUP., 1998, *Development Of The World Health Organization WHOQOLBREF Quality Of Life Assessment.* Psychol Med;28:551-558.

THE WHOQOL GROUP., 1998, *The World Health Organization Quality Of Life Performansın Ölçülmesi Ve Assessment (WHOQOL): Development And General Psychometric Properties.* Soc Sci Med;46,1569 1585.

ZHANG XT, L.İ., L.Y., WANG, S.L., MU, X.L., WANG, M.Z., SONG, W., 2005, *Improvements İn Quality Of Life And Disease-Related Symptoms İn Patients With Advanced Non-Small Cell Lung Cancer Treated With Gefitinib.* Chin Med J (Engl). Oct 5;118(19):1661–1664.

ZORBA, E., BABAYİĞİT, G.İ., SAYGIN, Ö., İREZ, G., KARACABEY, K., 2004, *65–85 Yaş arasındaki yaşlılarda 10 haftalık antrenman programının bazı fiziksel uygunluk parametrelerine etkisinin araştırılması.* Fırat Üniversitesi Sağlık Bilimleri Dergisi, 18(2): 229–234.