



Comparison of Physical Activity Levels of Elderly People Living in Rural and Urban Areas of Turkey

Türkiye'de Kırsal ve Kentsel Bölgede Yaşayan Yaşlıların Fiziksel Aktivitelerinin Karşılaştırılması

Tuğba Arslan¹, Bilge Kara², Serdar Arslan³

¹Institute of Health Sciences, Ege University, Izmir, Turkey

²Physical Therapy and Rehabilitation Highschool, Dokuz Eylül University, Izmir, Turkey

³Faculty of Health Sciences, Necmettin Erbakan University, Konya, Turkey

T. Arslan 
0000-0001-8726-0128

B. Kara 
0000-0003-4503-5074

S. Arslan 
0000-0002-5070-2524

Geliş Tarihi / Date Received:
15.01.2018

Kabul Tarihi / Date Accepted:
08.03.2018

Yayın Tarihi / Published Online:
08.06.2018

*Yazışma Adresi /
Corresponding Author:*
Tuğba Arslan
Ege Üniversitesi, Sağlık
Bilimleri Enstitüsü, İzmir,
Turkey
E-mail: tubapksr@gmail.com

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ABSTRACT

Objective: Physical function diminishes with age because of physical, psychological and environmental factors. This study aims to compare the physical performance, physical activity and life quality of elderly people who live in rural and urban areas of Turkey.

Materials and Methods: In total, 174 participants were included in the study, 88 living in urban areas and 86 living in rural areas. Socio-demographic characteristics of the participants were recorded. Daily metabolic equivalent (MET) scores were calculated for physical activity levels. Time performance tests and the Nottingham Health Profile inventory were also used. Rural and urban residents' data were compared.

Results: According to their daily MET values, physical activity levels of elderly people living in rural and urban areas were similar ($p>0.05$). Elderly men living in rural areas were more successful in the performance test of changing from the supine to sitting position, whereas elderly women living in urban areas were more successful in the stairs climbing performance test ($p<0.05$). The difference between the groups' quality of life scores was not significant ($p>0.05$).

Conclusions: Living environment does not create a difference in terms of physical condition and health-related life quality of elderly people in Turkey, for the population in question.

Keywords: Environment, aging, physical activity, health-related life quality

ÖZ

Amaç: Fiziksel fonksiyon yaşla birlikte fiziksel, psikolojik ve çevresel faktörler nedeniyle azalır. Çalışmanın amacı kırsal ve kentsel bölgede yaşayan yaşlıların fiziksel performans, fiziksel aktivite ve yaşam kalitelerini karşılaştırmaktır.

Gereç ve Yöntemler: Toplam 174 yaşlı çalışmaya dahil edildi; bunların 88'i kentsel bölgede, 86'sı ise kırsal bölgede yaşamakta idi. Katılımcıların sosyo-demografik verileri kaydedildi. Günlük metabolik eşdeğer (MET) hesaplaması fiziksel aktiviteyi belirlemek için kullanıldı. Süreli performans testleri ve "Nottingham Sağlık Profili" anketi kullanıldı. Kırsal ve kentsel bölge sakinlerinin verileri karşılaştırıldı.

Bulgular: Kırsal ve kentsel bölgede yaşayan yaşlıların fiziksel aktiviteleri günlük MET değerlerine göre benzerdi ($p>0.05$). Kırsal bölgede yaşayan erkek yaşlılar sırtüstünden oturur duruma gelmede; kentsel bölgede yaşayan kadın yaşlılar ise merdiven çıkıp inme performans testinde daha başarılıydı ($p<0.05$). Sağlıkla ilgili yaşam kalitesi skorları açısından gruplar arasındaki fark anlamlı değildi ($p>0.05$).

Sonuç: Söz konusu örneklem için, Türkiye’de yerleşim yeri yaşlıların fiziksel durumları ve sağlığa ilişkin yaşam kaliteleri açısından fark oluşturmamaktadır.

Anahtar Sözcükler: Çevre, yaşlanma, fiziksel aktivite, sağlıkla ilgili yaşam kalitesi

Available at: <http://journalofsportsmedicine.org> and <http://dx.doi.org/10.5152/tjism.2018.097>

Cite this article as: Arslan T, Kara B, Arslan S. Comparison of physical activity levels of elderly people living in rural and urban areas of Turkey. *Turk J Sports Med*. Published Online: 8th June, 2018

INTRODUCTION

The number of elderly population has increased continuously, both globally and in our country. The proportion of seniors aged 65 and over is 8.2% in Turkey (1). Aging brings negative morphological, physiological and pathological changes. These changes decrease physical and mental abilities. Physical function that is the most important determinant of individuals’ dependency levels decreases with age. Loss of physical function is one of the main problems that arise from aging (2). Physical performance measurements make it possible to detect functional loss.

Physical activity is important for the elderly, as well as for any age group. Since physical inactivity is one of the most important modifiable causes of chronic diseases such as coronary heart disease, high blood pressure, stroke, type 2 diabetes, colon cancer and breast cancer. Older adults who are physically active display better functional health, a lower risk of falling, and higher levels of cognitive function. This situation reduces daily life activity limitation risk (3,4). Physical activity level, physical function and health related quality of life are interrelated (4).

Urbanization impacts physical activity and has both negative and positive effects on physical activity, while increased vehicle traffic and building spaces affect it negatively. Employment, education, transportation facilities are considered as effecting positively (5). In Turkey, the majority of the elderly population lives in rural areas. Life styles in rural and urban areas are quite different socioculturally and economically in Turkey: rural areas have an agricultural economic and social structure, and transportation is more developed in urban areas than in rural areas. Generally, there are multi-storey apartment buildings in

urban areas, while rural areas consist mostly of one-storey houses (6). These factors imply that functional levels may differ according to place of residence.

There are limited research in the literature that have used performance measurements to determine physical function in elder people living in different environments (7,8). Studies in different parts of the world have shown that location affects the level of physical activity and quality of life (3,5,9,10). There is a limited amount of research on quality of life and level of physical activity in rural and urban areas in Turkey (11-13). According to our survey, there is no study examining the relationship between place of residence and physical performance in Turkey.

The present research aims to compare physical performance, physical activity and quality of life of elderly living in rural and urban areas in Turkey. The hypothesis is that older people living in rural areas in our country would have better physical activity level, physical performance and quality of life.

MATERIAL and METHODS

The population of the study consists of elderly people living in Izmir, Gaziemir, and the nearest three villages. Data were collected from 334 elderly participants between February and September, in 2009. Rural and urban areas have been defined according to local government laws. Accordingly, 164 of these participants were living in rural areas, and 170 were living in urban areas. The required sample size was calculated by using the inter-groups correlation coefficient table. It was determined that at least

86 people had to be included in the evaluation from each group at $p < 0.05$ significance level and at 80% power, according to the power tables. The participants were selected from the Gaziemir central district, and the villages of Küner, Develi and Tekeli by using stratified sampling and a simple random numbers table. The sample was randomly selected from records obtained from local authorities.

The inclusion criteria were being 65 or older, independent living alone or with family, to reside in the rural or urban area permanently for at least 12 month; not having serious systematic diseases, and hearing or sight loss; to have a score of 24 and higher in the mini mental status test, a score of 45 and higher in the Berg balance test, and a score of 12 and lower on the geriatric depression scale. A total of 79 people from rural areas and 83 people from urban areas were excluded from the study, for not complying with the inclusion criteria.

The Ethics Committee of University Clinic and Laboratory Research approval was obtained for this study. The research was carried out in accordance with the "Helsinki Declaration". All participants had given their informed consent for participation in the research study. Preliminary information about the participants' age, gender, height, weight, marital status, work status, public insurance and life style was obtained and recorded on the evaluation form. The dependent variables of this study were physical function, physical activity level and quality of life. The independent variable was place of residence.

Performance Measurements

Timed performance tests were conducted to measure the physical performance of participants. This is a very objective evaluation method. Tests were used to evaluate physical function of the elderly, by qualifying their daily living activities. During performance measurements, participants were asked to perform the determined activities as quickly as possible, and the performance time was recorded with a chronometer, in seconds. Tests were shown and taught to each participant, and each measurement was repeated three times.

The best time was recorded. Participants rested for 1 min between each measurement (14).

Rolling time: While lying in a supine position on a mat, the participants were asked to roll to one side and return to starting position as quickly as possible. Then the participant repeated the same performance on the opposite side. The total rolling time was obtained by adding both sides scores (14,15).

Lie/sit test: Starting from the supine position, participants were asked to move to a sitting position by swinging their feet (14,15).

Sit to stand: The test starts from a seated position. Participants performed five consecutive sit and stand movements from a chair, as rapidly as they could. Total time was recorded (14,15).

Fifty-foot walking test (50 FW): The participants walked as fast as possible for 25 feet, turned, and walked back to the starting point. Total duration of performance was recorded (14,15).

Climbing stairs test: The participants were asked to climb four steps, each of approximately 18 cm high, and to descend without waiting (14,15).

Physical Activity Evaluation

We used the Compendium of Physical Activities (CPA) scale to determine participants' physical activity levels. CPA scale is a questionnaire, which is based on the intensity of some specific activities. It can be expressed in metabolic equivalents (METs) to estimate energy expenditure of specific activities. Multiplying the MET value of the activity by body weight gives estimated energy expenditure (16). The scale categorizes all activities of individuals on a daily time frame. The CPA scale was constructed for the participant to complete the duration in minutes (15, 30, or 45 min) and hours (1-10 h) spent at each MET activity level on an average 24 h weekday. The CPA scale has nine levels of physical activity, namely 0.9 to 6 METs. For each level, the MET value is multiplied by the time spent on that particular physical activity level. The sum of the MET-time scores obtained from all levels yields a score that gives the level of daily physical activity within an average weekday.

Quality of Life Assessment

For the measurement of quality of life, the "Nottingham Health Profile" inventory was used. Its reliability and validity for the Turkish version was assessed by Küçükdeveci et al. (17), to evaluate quality of life in the elderly. This scale includes 38 questions in six categories (sleep, energy level, emotional status, social isolation, physical mobility and pain). The questions are yes/no questions, and the score is calculated according to the answers. Higher scores indicate low quality of life, and lower scores indicate high quality of life).

The data were evaluated by using the SPSS 15.0 statistics program. Percentage distributions, arithmetic means and standard deviations were used to evaluate demographic characteristics. The chi-square test was used for categorical

data analysis, and the independent sample t-test was used in numerical data analysis. The significance threshold was defined as $p < 0.05$ (18).

RESULTS

Participants' sociodemographic characteristics are given in Table 1. The mean age of the cases for those living in rural areas is 71.8 ± 5.8 and for those living in urban areas is 71.6 ± 5.5 . Age, BMI and marital status distributions for both groups were homogeneous ($p > 0.05$). However; gender, working status and public insurance were statistically and significantly different ($p < 0.05$). The number of females and the people with public insurance was higher in urban areas than in rural areas in this study, therefore data were analyzed by separating the genders.

Table 1. Sociodemographic characteristics of the participants

			Rural elderly (n=86)	Urban elderly (n=88)	p
Age (years)		X ± SD	71.8 ± 5.8	71.6 ± 5.5	0.83
BMI (kg/m²)		X ± SD	28.1 ± 5.4	27.3 ± 6.2	0.32
Gender	Female-Male	n (%)	40(46.5)-46(53.5)	27(30.7)-61(69.3)	0.01*
Working status	Active working- Not working	n (%)	9(10.1)-77(89.5)	1(1.1)-87(98.9)	0.01*
Marital status	Married-Single	n (%)	50(58.1)-36(41.9)	54(61.4)-34(38.6)	0.39
Public insurance	Yes-No	n (%)	75(87.2)-11(12.8)	87(98.9)-1(1.1)	0.01*
Life style	Alone-With family	n (%)	14(16.3)-72(83.7)	11(12.5)-77(87.5)	0.31

*:p<0.05

Different performance measures reveal different results. Elderly men from rural areas changed position from supine to sitting in shorter time than men from urban areas. On the other hand, elderly women living in urban areas climbed and descended stairs more quickly than elderly women living in rural areas. These differences

were statistically significant ($p < 0.05$), (Table 2). There was no significant difference in other performance measurements ($p < 0.05$). Physical activity levels of both male and female participants were higher in rural residents than city dwellers. But this difference was not statistically significant ($p < 0.05$), (Table 2).

The scores of urban women residents in the energy dimensions of the quality of life scale were lower, and the difference was statistically significant ($p < 0.05$), (Table 3). However, in terms of pain, sleep and social isolation and emotional reaction dimensions of the quality of life scale,

the existing difference was not statistically significant in female participants ($p > 0.05$), (Table 3). In male participants, differences among groups for all dimensions of the quality of life scale was not significant ($p > 0.05$), (Table 3).

Table 2. The participants' physical performance and physical activity measurements

Performance measurements		Rural elderly (n=86)	Urban elderly (n=88)	p
Total rolling time (s)	Men	4.18 ± 1.50	4.43 ± 1.61	0.52
	Women	6.04 ± 2.67	5.80 ± 2.65	0.65
Lie to sit (s)	Men	1.36 ± 0.49	1.91 ± 1.27	0.01*
	Women	2.32 ± 1.30	2.55 ± 1.22	0.34
Sit to stand (s)	Men	10.87 ± 3.52	11.53 ± 4.67	0.51
	Women	16.48 ± 6.34	14.39 ± 4.81	0.05
Fifty-foot walking test (s)	Men	27.04 ± 4.58	26.29 ± 3.59	0.47
	Women	31.25 ± 7.20	29.83 ± 5.70	0.25
Climbing stairs (s)	Men	6.32 ± 3.68	6.04 ± 2.39	0.72
	Women	11.42 ± 8.35	8.62 ± 3.60	0.02*
Physical activity level (24 h, METs)	Men	42.3 ± 11.0	38.5 ± 8.4	0.14
	Women	33.7 ± 7.4	33.6 ± 5.3	0.98

As mean ± SD. *: $p < 0.05$

Table 3. Comparison of the participants' quality of life

"Nottingham Health Profile"		Living in rural area (n=86)	Living in urban area (n=88)	p
Physical mobility	Men	16.0 ± 15.2	14.8 ± 13.4	0.74
	Women	30.4 ± 18.6	33.4 ± 16.7	0.38
Pain	Men	15.5 ± 18.7	21.1 ± 25.9	0.30
	Women	42.8 ± 29.6	34.8 ± 26.1	0.13
Sleep	Men	29.0 ± 21.7	24.4 ± 19.5	0.38
	Women	46.1 ± 27.0	41.3 ± 32.2	0.41
Energy	Men	23.3 ± 34.3	27.8 ± 36.2	0.60
	Women	60.7 ± 34.3	44.8 ± 39.7	0.03*
Social isolation	Men	10.0 ± 18.1	13.3 ± 22.9	0.50
	Women	19.1 ± 19.8	17.4 ± 21.7	0.66
Emotional reactions	Men	9.8 ± 11.7	7.8 ± 11.5	0.49
	Women	20.7 ± 16.1	21.0 ± 22.4	0.93

*: $p < 0.05$

DISCUSSION

Elderly population has higher growth rate than other age groups in Turkey. In 2014, the growth rate of the total population was 13.3 ‰ and the

growth rate of elderly population was 49.9 ‰. The elderly often live in rural areas in Turkey (19). However, the elderly population living in the city is reported to be increased by 2030 (20). Our study is planned to examine the relationship between the settlement and physical function of elderly living in Izmir, Turkey. Timed performance measurements, physical activity and quality of life survey were used. The results were similar for elderly who live in rural or urban areas.

In the literature, there are different results about physical performance of elderly. Morala et al. have found strong correlation between functional status scores and place of residence. They used both trunk and lower extremity performance measurements in their study on 200 elderly people. They found that elderly people living in urban areas have a higher level of physical function (7). Peel et al. used in their study lower extremity performance tests, and older people living in rural areas were found to be better than urban residents (8). In our study, rural male dwellers had better trunk performance than their urban counterparts. In addition, it has been shown that urban female dwellers have better stair performance than rural elder women. In this study, the results of detailed performance measurements revealed that different results in the literature may derive from the use of different parts of the body. In addition, five different time performance tests were used in this study, and each test produced different results. It can be said that physical performance results change according to physical performance test that is used.

Seniors living in rural areas have been reported to be more active in some studies. Ntandou et al. evaluated physical activity levels in their study with metabolic syndrome prevalence among 541

elderly people living in different settlements, and found that the MET values of those living in the city were higher than those of villagers (3). Pan et al. found that villagers were more active in their study about elderly people living in different settlements of Taiwan (21). Unlike the literature, according to findings of this study, residential area did not affect the level of physical activity. Additionally, active working level of the elderly in rural areas was found to be quite higher than the urban elderly. This difference may have affected this study's results. Furthermore, Troped stated in his study that recreational physical activity level was not affected by residence, and that physical activity level may vary only by means of transportation (22). Arnadottir et al., however, showed that physical activity level related to work was higher for villagers, whereas physical activity level related to leisure was higher for city dwellers (5). These data suggest that future studies need to evaluate physical activity levels related to work, transportation and leisure, and also barriers to physical activity, altogether. Physical activity levels are affected by many physiological, behavioural, psychological and environmental factors. Wilcox et al. emphasized education level as a cause of sedentary life styles (23). The importance of physical activity suggests that education levels should be improved, rural people should be encouraged to engage in recreational activities in rural areas, and the environment should be organized to stimulate activity in urban areas. There are differences between genders for physical activity (24). Similarly, in our results men had higher MET levels than women.

Studies in the literature have reported that the quality of life of elderly people living in rural area was lower (9,10). Researchers attributed this difference to causes such as age, education level, marital status and economic level. Other studies have reported that elderly people living in rural areas had better quality of life, and regarded better physical function as the main cause of this difference (25,26). Wallace et al. reported that elderly living in urban areas were

better in the physical dimensions, but worse in the mental dimensions of the quality of life scale in their study that compared elderly people living in rural and urban areas (27). In female participants, the quality of life was not statistically significantly different in sub-units other than energy, whereas in male participants, for all sub-units, settlement did not yield a statistically significant difference. In addition, our results revealed that similar physical function and physical activity levels of older people meant similar health-related quality of life as well.

There are several limitations to this study. There were elderly people both in the age range of 65-75 and 75-85. Studies can be done within a much more limited age range. Physical performance measurements may have been affected by environmental conditions. Laboratory tests could have been added. Future studies are needed, containing more detailed measurements of physical activity, inactivity, and physical activity barriers. Those living alone or with one of our participants did not give such a clear distinction.

CONCLUSIONS

In our study, physical function, physical activity level and quality of life except some subgroups were identified to be not affected by place of residence for elderly. In other words, in terms of both physical and emotional conditions, either living in rural or urban areas was not found to be advantageous for the elderly. Our foresight should be supported by cohort studies.

Acknowledgement

In this study there is no conflict of interest. No sources of funding were used.

REFERENCES

1. TÜİK. İstatistiklerle yaşlılar, 2014. *Haber Bülteni*. 2015; 18620. <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=18620>. Accessed 14 Aug 2016.
2. Abdulraheem IS, Oladipo AR, Amodu MO. Prevalence and correlates of physical disability and functional limitation among elderly rural population in Nigeria. *J Aging Res*. 2011; doi:10.4061/2011/369894.
3. Ntandou G, Delisle H, Agueh V, et al. Abdominal obesity explains the positive rural-urban gradient in the prevalence of the metabolic syndrome in Benin. West Africa. *Nutr Res*. 2009;29(3):180-9.
4. WHO. Physical activity and older adults. http://www.who.int/dietphysicalactivity/factsheet_olderadults/en/. Accessed 14 Aug 2016.
5. Arnadottir SA, Gunnarsdottir ED, Lundin-Olsson L. Are rural older Icelanders less physically active than those living in urban areas? A population-based study. *Scand J Public Health*. 2009;37(4):409-17.
6. Pazarlıoğlu MV. İzmir örneğinde iç göçün ekonometrik analizi. *Yönetim ve Ekonomi Celal Bayar Üniversitesi İİBF Dergisi*. 2007;14(1):121-36.
7. Morala DT, Shiomi T, Maruyama H. Factors associated with the functional status of community-dwelling elderly. *J Geriatr Phys Ther*. 2006;29(3):101-6.
8. Peel C, Sawyer Baker P, Roth DL, et al. Assessing mobility in older adults: the UAB Study of Aging Life-Space Assessment. *Phys Ther*. 2005;85(10):1008-119.
9. Ng N, Hakimi M, Byass P, et al. Health and quality of life among older rural people in Purworejo District, Indonesia. *Glob Health Action*. 2010;Suppl 2:78-87.
10. Weeks WB, Kazis LE, Shen Y, et al. Differences in health-related quality of life in rural and urban veterans. *Am J Public Health*. 2004;94(10):1762-7.
11. Özyurt BC, Tunç B, Hatipoğlu S. Yaşlıların yaşlılıkla ilgili tutumları: Manisa'da bir kentsel ve kırsal bölge örneği. *Akademik Geriatri*. 2013;5:29-37.
12. Teo K, Chow CK, Vaz M, et al. The Prospective Urban Rural Epidemiology (PURE) study: examining the impact of societal influences on chronic noncommunicable diseases in low-, middle-, and high-income countries. *Am Heart J*. 2009;158(1):1-7.
13. Onat ŞŞ. Yaşlı bireylerde sosyodemografik özellikler ve kognitif fonksiyonların yaşam kalitesine etkisi. *Türk Osteoporoz Derg*. 2013;19:69-73. doi: 10.4274/tod.69875.
14. Bonder Bette R, Dal Bello-Haas V. *Functional Performance in Older Adults*. 3rd ed. Philadelphia: FA Davis Co; 2009. p. 429-43.
15. Yildirim Y, Kara B, Erbayraktar S. Six month physiotherapy assessments on the patients exposed to the two different operations for their lumbar disc hernias. *J Musculoskelet Res*. 2009;12(1): 1-10.
16. Aadahl M, Kjær M, Kristensen JH, et al. Self-reported physical activity compared with maximal oxygen uptake in adults. *Eur J Cardiovasc Prev Rehabil*. 2007;14(3): 422-8.
17. Küçükdeveci AA, McKenna SP, Kutlay S, et al. The development and psychometric assessment of the Turkish version of the Nottingham Health Profile. *Int J Rehabil Res*. 2000;23(1):31-8.
18. Aksakoğlu G. *Sağlıkta Araştırma ve Çözümleme*. İzmir: Dokuz Eylül Üniversitesi Rektörlük Basımevi; 2006. p. 184-202.

19. TÜİK. *İstatistiklerle Yaşlılar 2014 (TurkStat Elderly Statistics 2014)* Ankara: TÜİK Matbaası; 2015. p. 4-28.
20. Mandıracıoğlu A. Dünyada ve Türkiye'de yaşlıların demografik özellikleri. *Ege Tıp Dergisi*. 2010;49(3 Suppl): 39-45.
21. Pan LY, Hsu HC, Chang WC et al. Trajectories of physical activity and risk factors among Taiwanese older adults. *Int J Behav Med*. 2015;22(1):62-9.
22. Troped, PJ, Saunders RP, Pate RR, et al. Correlates of recreational and transportation physical activity among adults in a New England community. *Prev Med*. 2003;37(4):304-10.
23. Wilcox S, Castro C, King AC, et al. Determinants of leisure time physical activity in rural compared with urban older and ethnically diverse women in the United States. *J Epidemiol Community Health*. 2000;54(9):667-72.
24. Caspersen CJ, Pereira MA, Curran KM. Changes in physical activity patterns in the United States, by sex and cross-sectional age. *Med Sci Sports Exerc*. 2000; 32(9):1601-9.
25. Mudey A, Ambekar S, Goyal RC, et al. Assessment of quality of life among rural and urban elderly population of Wardha district, Maharashtra, India. *J Stud Ethno-Med*. 2011;5(2):89-93.
26. Gambin G, Molzahn A, Fuhrmann AC, et al. Quality of life of older adults in rural southern Brazil. *Rural Remote Health*. 2015;15(3):1-12.
27. Wallace AE, Lee R, MacKenzie TA, et al. Longitudinal analysis of rural and urban veterans' health-related quality of life. *J Rural Health*. 2010;26(2):156-63.