

RELATIONSHIP BETWEEN PHYSICAL ACTIVITY AND HEALTH-RELATED QUALITY OF LIFE IN ELDERLY PEOPLE: A CROSS-SECTION STUDY

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Abstract: Objectives: This study aimed to investigate the relationship between physical activity level and health related quality of life in elderly people.

Design: Between January and April 2017, a cross-sectional study of 114 elderly people (73 males and 41 females) conducted this study. Their mean age was (71 ± 5.24) and the mean body mass index (BMI) was (29 ± 3.31). The participating elderly were classified according to walking duration into two groups, low level of physical activity (walking duration < 150 min/week) and high level of physical activity (walking duration > 300 min/week). The health-related quality of life (HRQoL) was measured using the Euro Qol-5 dimensions-3 levels scale questionnaire (EQ-5D-3L). Statistical analysis was used to determine the relation between the physical activity and HRQoL scores in elderly people.

Results: The measures showed statistically significant differences between high and low physical activity groups ($p < 0.05$). The group of high physical activity showed higher HRQoL scores more than the group of low physical activity in the all five dimensions. The low level group showed high predominance of the chronic disease.

Conclusions: High level of physical activity has a beneficial effect on all dimensions of the HRQoL in elderly people. Effort and awareness should be dedicated to encouraging the active lifestyle among different population especially elderly people.

Keywords: elderly, physical activity, HRQoL, EuroQoL.

INTRODUCTION

Aging is rapidly increasing worldwide (1), health governments are highly interested in protecting and

advancing the level of health with live ignited and sustaining the maximum life quality. Kindred population above 65 years old has heightened significantly in Spain, between 1975 and 2015 from 10-18% of the total number of people (2).

HRQoL is a health condition symptom of the people's everywhere and it can be a necessity for distinct contexts, as experimental researches, assessments of health care stinting or health of population reconnoiter (3). Many various approaches of HRQL live, the HRQoL was defined as the measure appointed for the life period, which adjusted with the deteriorations, conditions of function, intuitions and possibility socially that are affected through illness, injuries, handling or treatment and guidelines (4). Many templates directing to these various dimensionally thought were suggested throughout these years (5, 6).

The HRQoL model comprises of many domains, including overall quality of life (QoL), general health, symptom, biological, and functional statuses, not only the mentioned five domains but also include environmental and individual dimensions. Every domain affects directly on the subsequent domain (function status is affected by symptom status and this affected by biological variables). But the environmental and individual variables influence directly all domains measure except biological domain (5).

The HRQoL is one of many dimensions conceptualization that view social, mental, and physical outlooks (7). The HRQoL evaluation is a critical constituent of physical and mental health assessment (8). Several implements were matured to evaluate HRQoL in various communities. Many important factors are associated with clinical and demographic characteristics, compri-

sing patient age, medical status, language, and culture of the community are vital in formation to use a related reliable and valid measure of HRQoL (8, 9).

Physical activity seems to be related to improving functional performance and HRQoL (7, 9, 10, 11). Physical exercise may assist older adults to repossess or sustain the health of aging people (12). Regular leisure time of physical exercise can lead to a high level of HRQoL in elderly people (13, 14).

Also, regular physical activity may proportionately assist elderly people to inhibit a decrease of HRQoL and enhance the enjoyment of their life (15). Because of these important determinants that support better elderly health, evaluating the relationship between physical activity level and HRQoL scores in elderly people became greater needed, particularly compared to the increase of the elderly number in the world. This study aimed to evaluate the relationship between physical activity and HRQoL scores in elderly people.

SUBJECTS AND METHOD

Between January and April 2017, a cross-sectional study on 114 elderly people (73 males, 41 females) aged ≥ 65 years were recruited in this study. All participants were considered eligible when they met the inclusion criteria of being independent walking without any cognitive disorders. This independent walking was evaluated according to walking capacity of the participants (can walk at least 6 minutes without assistance) (10). All subjects with severe life-limiting illness, orthopaedic limitations, cognitive disorders that couldn't know anything about his age, childhood, and couldn't respond to examiner questions were excluded from this study. The participating elderly were classified according to walking duration into two groups, low level of physical activity (walking duration < 150 min/week) and high level of physical activity (walking duration > 300 min/week) (10). Each participant was informed about the objectives and procedure of the study and instructed to sign a written informed consent before starting the study. It was conducted at the outpatient physical therapy department, College of Applied Medical Sciences, Prince Sattam Bin Abdul Aziz University.

Procedure

Assessment procedures which were done through using the following:

a- Baseline clinical characteristics questionnaire; the patient data were recorded, including: age, gender, height, weight, work, past medical disease, medications, habits, motor or sensory dysfunctions.

b- The HRQoL questionnaire: It was measured using an Arabic version of the Euro QoL-5 dimensions-3

levels scale (EQ-5D-3L). It is a standardized instrument for measuring outcomes of health. It is well validated, reliable, and not need more time or effort to be completed and has been documented in many previous studies to measure HRQoL in a wide range of health conditions (16-18). It includes descriptive system (5 dimensions) and EQ visual analogue scale (EQ-VAS).

The EuroQoL group approved the validated Arabic version of the EQ-5D questionnaire to assess elderly people QoL (19). The EQ-5D comprises 5 dimensions, including; mobility, self care, usual activities, pain/discomfort, anxiety/depression. Each domain consists of 3 levels (no problems, slight/moderate problems, and severe/extreme problems). EQ-VAS assess HRQoL with 0-100 endpoints, 0 is the lowest imagine health and 100 is the highest imagine health.

Data Analysis

Descriptive statistics was done in the form of mean and standard deviation to assess the sample based on the physical activity and HRQoL. Mann-Whitney test was used to assess the arranged measures of EQ-5D. The Spearman's correlation coefficient was used to measure the strength and direction of the relationship between the physical activity and HRQoL. All analysis was done using SPSS version 18.0 (SPSS, Chicago, IL) with statistical significance at p-value ≤ 0.05 .

RESULTS

114 elderly people (73 males and 41 females) participated in this study. Their mean age was (71 ± 5.24) and the mean body mass index (BMI) was (29 ± 3.31) . 70.2% of the participants were diagnosed clinically with chronic disease as the following; 25.4% diabetes mellitus, 31.6% hypertension, 13.2% cardiovascular disease. About 93% the participating elderly weren't smoking and only 7% were smoking. Sleep quality was good in 83% of subjects and bad in 17% of subjects. Walking duration was less than 30 min/day in seventy six subjects and more than 30 min/day in thirty eight subjects. Clinical characteristics of all participating elderly demonstrated in Table 1. Also, clinical characteristics in high and low level of physical activity are demonstrated in Table 2.

The outcomes of HRQoL measures exhibited that the group of low physical activity level suffered walking problems started from slight/moderate to severe/extreme level as (90.3%, 64.5%, 85.5%, 88.2%, 81.6%) of the participants in mobility, self-care, usual activities, pain/discomfort, and anxiety/depression dimensions respectively. While the group of high physical activity level suffered waking problems only in slight/moderate

Table 1. Clinical characteristics of the all participants

Characteristics	N (%)
Sex	
Males n (%)	73 (64)
Females n (%)	41 (36)
Age mean \pm SD	71 \pm 5.24
Height (cm) mean \pm SD	161 \pm 3.4
Weight (kg) mean \pm SD	76 \pm 7.14
BMI (kg/m ²) mean \pm SD	29 \pm 3.31
Medical diagnosed chronic disease	
Yes/No n (%)	80 (70.2) / 24 (29.8)
Diabetes Mellitus	29 (25.4)
Hypertension	36 (31.6)
Cardiovascular	15 (13.2)
Smoking habits (yes/no)	8 (7) /106 (93%)
Sleep quality (good/bad)	95/19
Walking duration n (%)	
Less than 150 min/week	76 (66.6)
More than 300 min/week	38 (33.4)

level as (36.8%, 23.7%, 31.6%, 60.5%, 52.6%) of the participants in the five dimensions respectively. No participant suffered any walking problems in severe/extreme level in all dimensions in a high physical activity group. The results showed statistically significant differences between the two groups; high and low physical activity groups ($p < 0.05$). The group of high physical activity exhibited higher measures more than the group of low physical activity in the all five dimensions. On EQ-VAS measure, the high level group showed higher scores more than a low level group ($p < 0.05$) as demonstrated in Table 3.

With correlation coefficient statistical analysis, strong positive correlation was exhibited in this study between physical activity level and the all five dimensions of the EuroQol questionnaire. This strong positive correlation means that higher physical activity level goes with high HRQoL scores (and vice versa) as demonstrated in Table 4.

Table 2. Clinical characteristics in the two groups; low and high level of physical activity

Items	Low physical activity (n = 76)	High physical activity (n = 38)	p-value
Sex (male/female)	49/27	24/14	< 0.05
BMI (kg/m ²)	31.2 \pm 3.5	29.3 \pm 4.2	< 0.05
Chronic disease n (%)	71 (93.4)	9 (23.7)	< 0.05
Diabetes mellitus n (%)	27 (35.5)	2 (5.3)	< 0.05
Hypertension n (%)	32 (42.1)	4 (10.5)	< 0.05
Cardiovascular disease n (%)	12 (15.8)	3 (7.9)	< 0.05

Table 3. HRQoL measures in low and high physical activity levels

HRQoL items	Low physical activity (n = 76)	High physical activity (n = 38)	p-value
Mobility n (%)			
No problems	7 (9.2)	24 (63.2)	< 0.05
Slight/Moderate problems	58 (76.3)	14 (36.8)	< 0.05
Severe/Extreme problems	11 (14.5)	0	< 0.05
Self-care n (%)			
No problems	27 (35.5)	29 (76.3)	< 0.05
Slight/Moderate problems	43 (56.6)	9 (23.7)	< 0.05
Severe/Extreme problems	6 (7.9)	0	< 0.05
Usual activities			
No problems	11 (14.5)	26 (68.4)	< 0.05
Slight/Moderate problems	51 (67.1)	12 (31.6)	< 0.05
Severe/Extreme problems	14 (18.4)	0	< 0.05
Pain/discomfort n (%)			
No problems	9 (11.8)	15 (39.5)	< 0.05
Slight/Moderate problems	52 (68.4)	23 (60.5)	< 0.05
Severe/Extreme problems	15 (19.8)	0	< 0.05
Anxiety/depression n (%)			
No problems	14 (18.4)	18 (47.4)	< 0.05
Slight/Moderate problems	43 (56.6)	20 (52.6)	< 0.05
Severe/Extreme problems	19 (25)	0	< 0.05
EQ-VAS (Mean \pm SD)	60 \pm 11.42	87 \pm 8.31	< 0.05

Table 4. The Spearman' correlation coefficient between HRQoL and Physical activity levels

HRQoL items	95% confidence interval		r _s
	Lower	Higher	
Mobility scores	-0.641	-0.397	0.617
Self-care scores	-0.593	-0.349	0.512
Usual activities scores	-0.628	-0.351	-0.527
Pain/discomfort scores	-0.462	-0.169	-0.356
Anxiety/depression scores	-0.511	0.163	-0.418
EQ-VAS score	0.451	0.722	0.649

DISCUSSION

This study aimed to evaluate the effects of physical exercise on elderly HRQoL in a group of functionally independent older people without cognitive disorders. Elderly with cognitive disorders were excluded because this disorder could influence the capability for supporting correct answers. Previous studies has taken same ruling (20, 21). The elderly were included in the study as the reliance influences the HRQoL evaluation, because their functional performance could affect it (20). In this study, HRQoL was explored as the elderly were independent and had no cognitive impairments. Therefore, this study was contributed to supply high comprehensive awareness of what factors more functionally distant are related to HRQoL in elderly people. Findings of this study may be beneficial in knowledge of the efficient assessment procedures to support the ideal lifestyle of the elderly people.

Thirty minutes walking had seemed to be directly associated with positive strength of leg muscles and physical capacity in elderly subjects (22). The physical activity was concluded and determined through the waking duration in the present study as the walking is the usual physical activity in aged people and can comfortably be adapted without effort in daily life (23).

In the EuroQoL, there are two functioning and subjective well-being domains that concern the HRQoL assessment in this current study. Functioning evaluation was assessed through mobility, self-care, and usual activities dimensions. While pain/discomfort and anxiety/depression dimensions were used to assess subjective well-being evaluation. Using of Arabic version of the EuroQoL was approved to be an easy and valid measure for elderly QoL (24).

According to findings of this study, the elderly comprised 77% of the low physical activity and the greater number of elderly documented as they were diagnosed with minimum one disease. The elderly participants with low activity were reported more commonly of lasting illness as, diabetes, hypertension, and cardiovascular disease. Light sports and walking have

positive impacts to control cardiovascular disease in postmenopausal women (25).

Many previous studies approved that regular physical activity have significant improvement in health and disease control. High level of physical activity in aged people seemed an international preference (26).

The elderly participants with high activity were high scores of all EuroQoL dimensions. Functioning evaluation domain showed higher records of mobility dimension in a high physical activity group than low physical activity group ($p < 0.05$). This result supports the high correlation between physical activity and HRQoL. Similar results were approved by Frandin et al as they reported that walkers have a better estimation of physical activity capacity than non-walkers (22).

Also, the elderly with high level of physical activity showed high scores of self-care and usual activities dimensions mentioned in EuroQoL. These two dimensions helped to improve the level independence and physical activity promoting reduction of disability risks in aged people (27). So, the present study investigated the relation between the level of physical activity and functioning domain variables.

In subjective well-being evaluation domain using pain/discomfort and anxiety/depression dimensions, most of all participants in this study showed slight pain/discomfort and slight anxiety/depression. There were significant differences in subjective well-being variables in high levels of physical activity compared with low physical activity level. In agreement with previous studies, the present study approved beneficial effects of physical activity on depression status and pain in elderly people (28, 29).

CONCLUSION

It was concluded that the high level of physical activity has a beneficial effect on all dimensions of the HRQoL in elderly people. Effort and awareness should be dedicated to encouraging the active lifestyle among different population especially elderly people.

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Declaration of interest

The authors declare no competing interests.

Abbreviations

BMI — body mass index

HRQoL — related quality of life

EQ-5D-3L — EuroQol-5dimensions-3levels scale questionnaire

EQ-VAS — EQ visual analogue scale

Sažetak

POVEZANOST NIVOVA FIZIČKE AKTIVNOSTI I KVALITETA ŽIVOTA KOD STARIH OSOBA: STUDIJA PRESEKA

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Cilj: Cilj ove studije bio je da se ispita povezanost nivoa fizičke aktivnosti i kvaliteta života kod starih. **Dizajn:** U periodu od januara do aprila 2017. godine, studija preseka je izvedena, i obuhvatala je 114 starih ljudi (73 muškarca i 41 žena). Srednja starosna dob je iznosila (71 ± 5.24) i srednja vrednost indeksa telesne mase (BMI) bila je 29 ± 3.31 . Učesnici studije su bili podeljeni na osnovu distance koju su mogli da prepešače u dve grupe – niskoaktivnu grupu (distance < 150 min/nedeljno) i visoko aktivnu grupu (distance > 300 min/nedeljno). Kvalitet zdravstvenog aspekta života je meren korišćenjem Euro Qol-5 dimension-3 level upitnika (EQ-5D-3L). Statistička analiza je korišćena da ispita povezanost fizičke

aktivnosti i HRQoL skorova kod starih osoba. **Rezultati:** Merenja su pokazala statistički značajnu razliku između visoko- i nisko aktivnih grupa ($p < 0.05$). Visoko aktivna grupa je pokazala viši HRQoL skor nego niskoaktivna grupa u svih 5 dimenzija. Niskoaktivna grupa je pokazala visoku zastupljenost hroničnih bolesti. **Zaključak: Viši nivo fizičke aktivnosti je imao bolji efekat na sve dimenzije HRQoL kod starih osoba. Napor i svest o fizičkoj aktivnosti treba da budu posvećeni ohrabrenju da se usvoje novi aktivni stilovi života među različitim populacijama, naročito kod starih ljudi.**

Ključne reči: stari, fizička aktivnost, HRQoL, EuroQoL.

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