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CORRELATION BETWEEN PHYSICAL ACTIVITY AND RISK FACTORS OF CHRONIC NON-COMMUNICABLE DISEASES IN PATIENTS IN FAMILY MEDICINE DEPARTMENT

KORELACIJA FIZIČKE AKTIVNOSTI I FAKTORA RIZIKA ZA HRONIČNE NEZARAZNE BOLESTI KOD PACIJENATA U AMBULANTI PORODIČNE MEDICINE

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physical activity, risk factors, NCDs, family doctor

Ključne reči
fizička aktivnost, faktori rizika, hronične nezarazne bolesti, porodični doktor

Abstract

Background: A lack of physical activity is the major factor contributing to diverse diseases, disability and mortality and family doctor has a key role in revealing risk factors in his patients.
Aim: To determine the patients level of physical activity and correlation between the level of physical activity and risk factors, as well as chronic non-communicable diseases (NCDs).
Methods: The study was conducted from January to March 2010. Family doctor interviewed randomly 100 patients using International Physical Activity Questionnaire (IPAQ), measured patients weight and height blood pressure and fasting blood glucose and cholesterol and noted the presence of NCDs. Eight patients were excluded from the analysis as they achieved more than 960 minutes on IPAQ.
Results: Out of 92 patients, 23 (25,0%) has low, 36 (39,1%) has moderate and 33 (35,9%) has high level of physical activity. Correlation coefficient is estimated for each level of physical activity and body mass index (BMI), and has statistical significance (p<0,05) only for walking (r=-0,239). Considering risk factors and NCDs, low back pain is present in 32 (34,78%), hypertension in 19 (20,65%), headache in 15 (16,30%), anxiety in 14 (15,22%), diabetes mellitus in 8 (8,70%), hypercholesterolemia in 6 (6,52%), coronary artery disease in 6 (6,52%). There is no statistical significance between NCDs and risk factors compared with the level of physical activity.
Conclusion: Regular physical activity contributes to human well-being, by lowering risk factors and incidence of NCDs and family doctor should promote physical activity in his everyday work.

BACKGROUND

For centuries it is known that health depends on proper eating habits and regular physical activity. Epidemiological facts and scientific evidence suggest that good eating habits and adequate training can reduce the incidence of heart attack, diabetes and other non–communicable diseases (NCDs). [1]

Physical inactivity is a global health problem that causes more than two million deaths each year making it one of the top 10 leading causes of death and disability (WHO, 2007). The combination of inadequate food intake, insufficient physical activity and smoking can cause coronary artery disease in 80% of whole population.

A lack of physical activity is the major factor contributing to diverse diseases, disability and mortality. Preliminary studies of World Health Organization (WHO) related to risk factors report that sedentary life style is one of ten leading causes of death and disability.

Guidelines for healthy adults under age 65 - Basic recommendations from ACSM and AHA:

- Do moderately intense cardio 30 minutes a day, five days a week or
- Do vigorously intense cardio 20 minutes a day, 3 days a week and
- Do eight to 10 strength-training exercises, eight to 12 repetitions of each exercise twice a week.[2]

The physical and psychological benefits of physical activity are well documented and are highlighted in the Chief Medical Officer's report which recommends at least 30 minutes of moderate intensity physical activity a day. [3]

Current assessment of WHO in 2007 report that 60% to 85% of adults worldwide "are not active enough to benefit their health." Precise assessment of physical activity is essential for planning, implementing, and evaluating public health programs and policies addressing this issue (NCCDPHP, 2007; Sarkin, Nichols, Sallis, & Calfas, 2000).

During several past decades, epidemiological studies reported that physical inactivity is related to diverse NCDs and risk factors such as obesity, coronary artery disease (CAD) and cancer.[4] According to data of WHO, it is estimated that physical inactivity causes globally approximately 10-16% breast cancer, colorectal cancer and diabetes and 22% CAD. Eventually, 1,9% million death cases are related to physical inactivity.[5]

The International Physical Activity Questionnaire (IPAQ, 2007) were developed as a set of internationally comparable, valid, and reliable instruments (Craig et al., 2003) that examine self-reported Physical Activity and sedentary behaviors.

The role of primary health care is to promote healthy lifestyle and physical activity in prevention of NCDs as they are more often nowadays.

Aim

-To determine the patients level of physical activity in patients in family medicine department
-To determine the correlation between the level of physical activity on one side and risk factors of NCDs on the other side.

Methods

The study was conducted from January to March 2010. In Primary Health Care Center Banjaluka. Family doctor interviewed randomly 100 patients using International Physical Activity Questionnaire (IPAQ),that measures the level of physical activity in adult population (18-69 years old). Family doctors measured patients weight and height, blood pressure and fasting blood glucose and cholesterol and noted the presence of NCDs. Eight patients were excluded from the analysis as they achieved more than 960 minutes as a sum of walking, moderate and vigorous phys-

ical activity according to guidelines for data processing and analysis of IPAQ.

Statistics parameters used in the study were: frequencies, percentages, chi-square (χ^2) test, Pearson's correlation coefficient, using the level of statistical significance of 95%. For data processing analysis is used computer software SPSS.

RESULTS

Out of 92 patients, 47 (51,1%) were female and 45 (48,9%) were male. Patients were divided into groups and the age range in each group was ten years period. In the group II (age range 25-34 years) were 28 (30,4%) and in the group III (age range 35-44 years) were 29 (31,5%) patients; those groups have the majority of the interviewed patients. Considering employment status, the majority of patients are employed 53 (57,6%), followed by retired persons 18 (19,6%), students 11 (12,0%), unemployed 10 (10,9%). (Table 1)

Out of 92 patients, 23 (25,0%) has low, 36 (39,1%) has moderate and 33 (35,9%) has high level of physical activity. According to level of physical activi-

Table 1. Sample

	Frequency f	Percentage %
Total	92	100
Sex		
-Male	45	48.9
-Female	47	51.1
Age range		
19-24	6	6.5
25-34	28	30.4
35-44	29	31.5
45-54	8	8.7
55-64	12	13.0
≥65	9	9.8
Employment status		
-employed	53	57.6
-unemployed	10	10.9
-student	11	12.0
-retired persons	18	19.6

ty, there is no statistical significant difference among patients. Correlation coefficient is estimated for each level of physical activity and body mass index (BMI), and has statistical significance (p<0,05) only for walking (r=-0,239). Patients with higher BMI spend less

time walking then the others and that is statistically significant. One the other side, comparing patients with moderate and high level of physical activity and their BMI, correlation coefficient has no statistical difference. (Table 2)

Tabela 2. Prevalence of the type of physical activity (IPAQ) and correlation coefficient of types of physical activity and body mass index (BMI)

Variable physical activity	prevalence		BMI (Body mass index)	
	f	%		MET scor
Low	23	25.0	R	-.239*
			P	.024
			F	90
Moderate	36	39.1	R	.006
			P	.958
			f	90
Vigorous	33	35.9	r	-.056
			p	.603
			f	90
Total	92	100	r	-.059
			p	.580
			f	90
χ^2	3.022			
df	2			
p	.221			

$\chi 2$ -Chi-square test
r - Pearson's correlation coefficient
df   -   degree of freedom
p   -   statistical significance level

Level of physical activity in MET minutes
Vigorous > 3000 MET minutes per week
Moderate 600 - 3000 MET minutes per week
Low < 600 MET minutes per week

Chart 1. Prevalence of NCDs in percentage

Table 3. Correlation coefficient of MET score and fasting blood glucose, serum cholesterol level, BMI, systolic and diastolic blood pressure
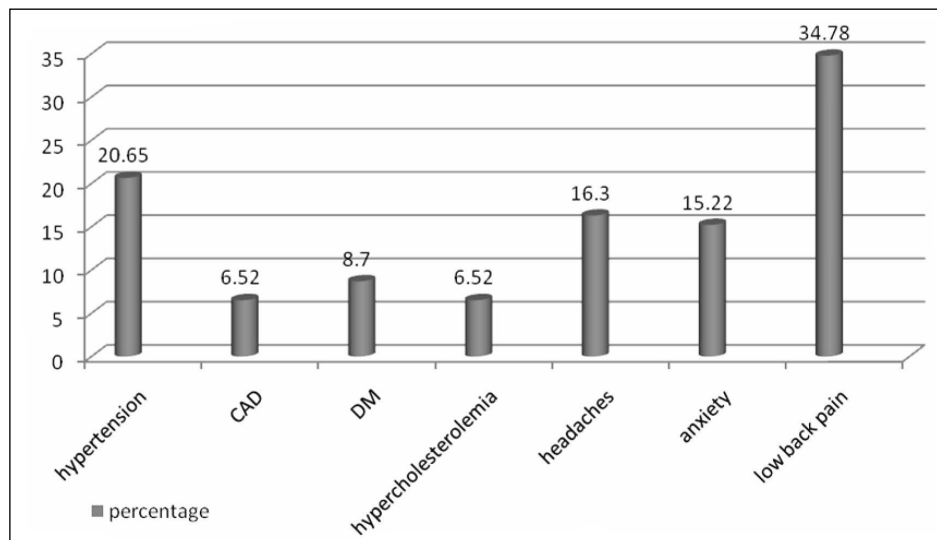
		METskor
Fasting blood glucose	r	-.143
	p	.355
	N	44
Serum cholesterol level	r	-.018
	p	.910
	N	41
BMI (Body mass index)	r	-.059
	p	.580
	N	90
Systolic blood pressure	r	.100
	p	.347
	N	91
Diastolic blood pressure	r	-.026
	p	.803
	N	92

r - Pearson's correlation coefficient
df   -   degree of freedom
p   -   statistical significance level

In the Chart 1, we presented NCDs in interviewed patients. Considering risk factors and NCDs, low back pain is present in 32 (34,78%), hypertension in 19 (20,65%), headache in 15 (16,30%), anxiety in 14 (15,22%), diabetes mellitus in 8 (8,70%), hypercholesterolemia in 6 (6,52%), coronary artery disease in 6 (6,52%).

Comparing the score gained on IPAQ and fasting blood glucose, serum cholesterol, BMI, systolic and diastolic pressure correlation coefficient showed no statistical significant difference.

Comparing the score gained on IPAQ and NCDs: hypertension (r=0,032); CAD (r=0,077); diabetes (r=-0,043); hypercholesterolemia (r=-0,037), headaches (r=-0,138); anxiety (r=-0,020), low back pain (r=-0,058), there is no statistical significance between NCDs and the level of physical activity. (Table 4)

DISCUSSION

In our sample, ¼ of patients has walking as a type of physical activity, while others have moderate and vigorous physical activity.

Table 4. Correlation coefficient of present NCDs and MET score

		METskor
Hypertension	r	.032
	p	.759
	N	92
CAD	r	.077
	p	.467
	N	92
Diabetes mellitus	r	-.043
	p	.681
	N	92
Hypercholesterolemia	r	-.037
	p	.725
	N	92
Headaches	r	-.138
	p	.189
	N	92
Anxietyr	r	-.020
	p	.847
	N	92
Low back pain	r	-.058
	p	.584
	N	92

r - Pearson's correlation coefficient
df - degree of freedom
p - statistical significance level

The study in Japan that included 575 persons age 55-75 years has shown that 80% of them participate in weekly physical activity and the total physical activity was similar between male and female.[7]

The study conducted in Ho Chi Minh City included 1906 inhabitants and showed high percentage of adults who are physical inactive and 56,2% age 25-64 years achieved minimally recommended physical activity of moderate intensity 30 minutes 5 days a week.[8]

The prevalence of physical activity that was investigated in 15 countries of European Union in 2002 included 16230 persons,and reported that median MET (metabolence equivalence estimates) hours per week was the highest in the Netherlands (39,43 MET hours/week), followed by Germany (34,65 MET hours/week in the eastern part, 33,90% MET hours/week in the western part), Luxembourg (31,55 MET hours/week). The lowest MET estimates were reported in Northern Ireland (11,55 MET hours/week), Sweden (18,65 MET hours/week) and France (19,55 MET hours/week).[9]

The risk of hypertension and physical activity were investigated in Finland and included 3931 men and 4381 women age 24-51 years and showed that regular vigorous physical activity is related to low risk of hypertension in men, while there is no correlation between physical activity and incidence of hypertension in women. [10]

Increased physical activity is associated with reduced CAD morality. This protective effect can partly be explained by the increase of HDL cholesterol levels following aerobic physical activity. Exercise induced changes in HDL-C levels may also be gender dependent. The volume of exercise required to increase HDL-C levels appears to be higher for women than men. This perhaps is due to higher baseline HDL-C levels in women compared with men. A practical approach in prescribing exercise for patients is to use moderate intensity exercises 3-5 times a week. Low and moderate level of physical activity should be preferred for lowering the risk of cardiac complications. [11]

Study in Finland that included 2840 persons followed –up the incidence of CAD, hypertension and diabetes during 10-years period. It was shown that vigorous activity once or more often a week was inversely associated with the risk of hypertension, both in men and women. For the women both a higher total amount of activity and weekly vigorous activity had an inverse association with the risk of diabetes. [12]

Meta-analysis performed by systematic MEDLINE search in 2007. included 33 studies with 883372 persons. Followed up range from 4 to 20 years. The majority of studies reported significant risk reduction for physical active participants; risk reduction considering cardiovascular mortality of 35%, all cause mortality of 33%. Studies that used patients questionnaires to assess physical activity reported lower risk reductions than studies that used more objective measures of fitness. [13]

The relation between moderate physical activity and all cause mortality was investigated in a study in Germany and it was shown that moderate physical activity compared to sedentary lifestyle has a clearly protective dose response relation (p<0,001) in women, but not in men. Moderate physical activity of 2,5 hours per week descreases the relative risk of all cause mortality for 0,65 in women and 0,90 in men. [14]

Study conducted in USA investigated how the type and intensity of physical activity takes part in incidence of CAD in men. The results showed that men who run an hour or more per week had 42% risk reduction compared with men that did not run. Men who trained with weights for 30 minutes or more per week had a 23% risk reduction compared with men who did not trained with weights. Rowing for one hour or more per week was associated with a 18% risk reduction. A half an hour or more of brisk walking was associated with a 18% risk reduction. [15]

CONCLUSION

The results of our survey showed that almost all interviewed patients had certain type of physical activity during a week. There is a correlation between the level of physical activity and BMI, while risk factors and NCDs in our sample did not have a statistical significant correlation with the level of physical activity. Surveys that included population worldwide showed the importance of physical activity for healthy well being. The key role of family physician is counseling patients concerning their physical activity and healthy lifestyle. Family doctors should prescribe moderate physical activity in duration of 30 minutes 5 times a week in accordance with AHA (American Heart Association) and American College of Sports Medicine recommendations. According to the results of our survey, patients with higher BMI spend less time walking. Therefore, it is necessary to promote walking as a type of physical activity that is adequate for all age groups and all groups of patients, as well as those who have NCDs.

Apstrakt

Uvod: Nedostatak fizičke aktivnosti je znacajan uzrok bolesti, smrti i onesposobljenosti, a porodični ljekar ima ključnu ulogu u otkrivanju riziko faktora kod pacijenata.

Cilj rada: Utvrditi nivo fizičke aktivnosti i povezanost nivoa fizičke aktivnosti sa faktorima rizika kao i sa hroničnim nezaraznim bolestima.

Metod rada: Studija je provedena od januara do marta 2010. Porodični doktor je intervjuisao 100 pacijenata koristeći anketni upitnik International Physical Activity Questionnaire (IPAQ) i izvršio mjerenje tjelesne mase i visine, krvnog pritiska, vrijednosti šećera i holesterola u krvi natašte i zabiježio prisustvo ranije dijagnostikovane hronične nezarazne bolesti kod ispitanika. Istraživanje je obuhvatilo 100 pacijenata, a podaci za 92 pacijenta su obrađeni prema uputstvu za IPAQ upitnik.

Rezulati: Od ukupno 92 ispitana pacijenta, 23 (25%) su imali nizak, 36 (39.1%) srednji i 33 (35.9%) visok nivo fizičke aktivnosti. Koeficijent korelacije između svakog nivoa fizičke aktivnosti sa body mass indexom (BMI) ima statističku značajanost p<0.05, samo kod šetnje (r = -0.239). Što se tiče riziko faktora i hroničnim nezaraznih bolesti, u najvećem procentu kod anketiranih se javljala bol u leđima 32 (34.78 %), zatim hipertenzija 19 (20.65%), glavobolja 15 (16.30%), anksioznost 14 (15.22%), diabetes mellitus 8 (8.70%), hiperholesterolemija 6 (6.52%) i koronarna bolest 6 (6.52%). U našem uzorku postoji korelacije faktorima rizika i hroničnim oboljenjima sa stepenom fizičke aktivnosti, ali bez statističke značajnosti.

Zaključak: Kontinuirana fizička aktivnost doprinosi zdravlju umanjujući riziko faktore i obolijevanje od hroničnih nezaraznih bolesti, a porodični ljekar bi trebao promovisati fizičku aktivnost u svom svakodnevnom radu.

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