Evaluation of Exercise, Occupational and Leisure-Time Activities in Outpatient Heart Clinics

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Abstract

Background- Physical inactivity has been recognized as one of the main risk factors for coronary heart diseases. This study analyzed occupational, commuting, and leisure-time physical activity in outpatients who referred to heart clinics.

Methods- This is a descriptive study that evaluated 499 outpatients of heart clinics in 2003-2004. Occupational, commuting, and leisure-time physical activities were assessed based on questionnaire data, the validity and reliability of which had already been confirmed. The statistical package (SPSS) for Windows was used for statistical analysis.

Results- In this study, 59% of the individuals who were unemployed and retired had coronary artery disease. Also, 38% of the individuals who were spending leisure time in the sitting and sleeping positions had coronary disease and 23% of this group had hypertension. Moreover, 48% of the outpatients did not have proper morning exercise, and 98% of this group did not have informal exercise with supervision and also 67% did not have informal exercise.

Conclusion- According to this study, occupational, commuting, and leisure-time physical activities of outpatients in heart clinics were low. Thus, encouraging physical activities should be on the top of the public health programs priorities ***(Iranian Heart Journal 2008; 9 (4):32-37).***

Key words: physical activity ■ occupational activity ■ leisure-time activity ■ heart disease

Physical inactivity has been recognized as one of the main risk factors for coronary heart disease (CHD) in industrialized countries.[1] The risk of CHD and coronary death among physically inactive people is markedly higher than that among those who are physically active.[2-5] Furthermore, there is an association between low socio-economic status (SES) and an increased risk of developing CHD.[6-9] The association between low SES and CHD could partly be explained by a higher prevalence of CHD risk factors among people with low SES.[6,10,11]

Relative risks come from the scientific literature demonstrating that heart disease, stroke, hypertension, type 2 diabetes, colon cancer, breast cancer, osteoporosis, depression, and anxiety are directly related to individual physical activity patterns in adults.[12] Nearly 12% of depression and anxiety and 31% of colon cancer, heart disease, osteoporosis, and stroke cases are attributable to physical inactivity.[12] Heart disease was the most expensive outcome of physical inactivity within the heath plan population, costing $35 million in 2000.

Total health plan expenditures attributable to physical inactivity were $83.6 million, or $56 per member.[12] National Institutes of Health Consensus Development Conference on Physical Activity and Cardiovascular Health concluded that intermittent or shorter bouts of physical activity (at least 10 minutes), including occupational and non-occupational activities and tasks of daily living, have similar CHD preventive effects and other health benefits if performed at a level of moderate intensity (such as brisk walking, cycling, swimming, home repair, and yard work) with an accumulated duration of at least 30 min/day.[21] Many sedentary activities have increased during the last decade, and occupational and non-occupational activities in epidemiologic studies have been ignored.

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Thus, this study was planned to evaluate occupational and leisure-time physical activities in outpatients of heart clinics.

Methods

This is a descriptive study that evaluated 499 outpatients of Zanjan heart clinics in 2003-2004. Occupational, commuting, and leisure-time physical activities were assessed using an international physical activity questionnaire. The participants were interviewed face to face by trained interviewers. The interview contained highly comprehensive questions on social, economic, lifestyle, and health indicators. The questionnaire had 56 questions in four parts:

Part one contained eight questions to obtain general information like age, gender, education grade, income, address, frequency of seeking medical advice, and diagnosis of disease (by cardiologists). Income level was classified into three categories:
1. Low income: less than $125 per month,
2. Moderate income: $125 to $375 per month, and
3. High income: more than $375 per month.

Part two comprised eight questions on daily physical activities like morning exercise, commuting physical activity by asking the frequency and duration of walking or cycling, the number of stairs that they climbed up, leisure-time physical activity, exertional level of daily physical activities, and so on.

Part three was comprised of 13 questions on job-related physical activities like kind of job, duration of work, level of job-related physical activities, and the body limbs used. The subjects reported their occupational physical activity according to the following three categories:
1. Low: physically very easy, sitting office work, e.g. secretary,
2. Moderate: work including standing and walking, e.g. store assistant and light industrial worker, and
3. High: work including walking and lifting, or heavy manual labor, e.g. industrial or farm work.

Part four contained 23 questions on sports that were split into two parts: formal and informal sports.
The amount of time spent in sport activities with or without supervision was noted. Prior to the study, the validity of the questionnaire was evaluated by experts and its reliability calculated via Cronbach's alpha coefficient (α=0.76). The main variables of this study were occupational, commuting, and leisure-time physical activities in outpatients of heart clinics. All the questions were revised by the research group. For data analysis, all the collected data of the patients' physical activities were coded, and statistical package (SPSS) for Windows was used for analysis. The Ethics Committee of Physical Education Organization of Zanjan approved this study.

Results

Of the 499 subjects in this study, 36% had coronary artery disease and 22% had hypertension. The mean age of the patients was 54 years old (SD =16). The prevalence of CHD in the men was more than that in the women (43% vs. 28%). Conversely, the prevalence of hypertension in the women was more than that in the men (27% vs. 17%). Also, 48% of the patients were illiterate, and 52.3% of the patients had a low income (less than $125 per month). The frequency of seeking medical advice amongst the urban people was more than that amongst the villagers (53% vs. 46%). Daily physical activity data revealed that 48% of the individuals did not have morning exercise, 55% of the subjects were walking and cycling for commuting, and the others used private or public transportation. Amongst the subjects that did not have walking or cycling exercise, 31% had CHD, 19% had hypertension, 23% had other cardiac diseases, and only 24% were healthy. At leisure time, 24% had exercise and physical activity and others spent their time sitting, lying, watching TV, sleeping, etc. (Fig.1).

Fig. 1. Frequency of physical activity of subjects at leisuretime

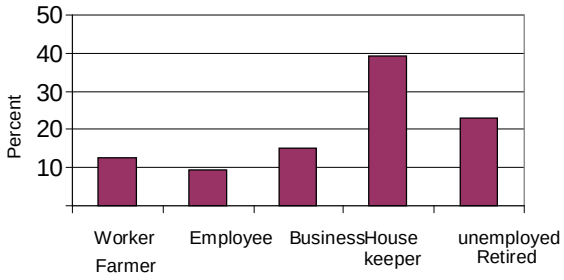

Fig. 3. Frequency of informal exercise among subjects

Amongst the individuals inactive during leisure time, 38% had CHD, 23% had hypertension, 20% had other cardiac disorders, and 5.17% were found to be normal. Amongst the different jobs, housekeeping women sought medical advice more than the other subjects did (38.5%). Amongst the unemployed and retired subjects, 52% had CHD, 17% had hypertension, and 21% had other cardiac diseases and only 10% were healthy. Job-related physical activities were high in 15%, moderate in 33%, low in 10%, immobile in 10%, and unemployed in 16%. Data regarding formal and informal sports in the subjects showed that 98% of them had no formal exercise and 67% of them did not have informal exercise like exercising at home, in parks, or other places (Fig. 3).

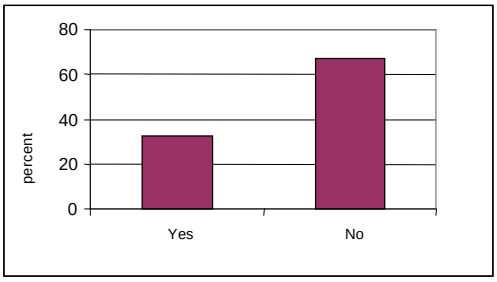

Fig. 2. Frequency of employment among subjects.

Considering the subjects that had low activity, 84% had CHD, hypertension, or other cardiac diseases and only 14% of the individuals in this group were healthy.

Discussion

Moderate or high occupational physical activity was associated with a reduced risk of CHD in both sexes.[22] One research indicated that daily walking or bicycling to and from work was correlated with a reduced risk of CHD among women, but not in men.[22] Simultaneously doing one, two, or three types of moderate or high occupational activities, commuting, and leisure-time physical activity has more protective value than one type.[22] Our study showed that amongst subjects without activity at leisure time (sleeping or sitting and so on), 38% had CHD, 23% had hypertension, and 20% had other cardiac diseases, and only 17.5% were healthy. Many previous studies emphasize the protective value of leisure-time physical activities.[23-29] While there is strong evidence that leisure-time physical activity is associated with a reduced risk of CHD amongst men[24,26,27,29] evidence among women is weaker.[23,25,28,30] Our study showed that amongst individuals who did not walk to work (used private or public transportation and so on), 31% had CHD, 19% had hypertension, and 23% had other cardiac diseases and only 24% were healthy. Only one study has thus far assessed the association of daily walking or bicycling to and from work with the risk of CHD amongst men, and it found no significant association;[31] the results were in conflict with

those of our study. A study conducted in 2006 showed the association of daily walking and bicycling to and form work with reduced risk of CHD amongst women but not in men. For example, in urban China, more than 90% of people walk or cycle to and from work daily.[22] In addition, type 2 diabetes is a major risk factor for CHD, and daily walking or cycling to and from work is associated with a decreased risk of type 2 diabetes amongst women but not in men.[32] Several studies have shown that regular walking or cycling to and from work is related to lower levels of cardiovascular risk factors[32-34] and stroke.[36] In our study amongst unemployed and retired subjects, 52% had CHD, 17% had hypertension, and 21% had other cardiac disorders and only 10% were healthy. The mechanisms linking physical activity to CHD have been partly elucidated. For example, physical activity has a lowering effect on blood pressure,[13] lipid levels,[14] plasma fibrinogen,[13-15] plasma viscosity,[15] and prevents type 2 diabetes mellitus, which in turn is a strong risk factor for CHD. [16-20] Sundquist showed a positive long-term effect of leisure-time physical activity on CHD risk amongst women and men in a 12-year follow-up study in Sweden.[35]

Our study showed that 76% of the subjects were sitting or lying during leisure time, while a Canadian study showed that the prevalence of leisure-time inactivity amongst women was 68% and amongst men was 50%. Unfortunately, in the United States, Britain, and most similar developed nations, fewer than half of adults have been regularly active,[38-40] which chimes in with our study.

Conclusions

According to this study, occupational, commuting, and leisure-time physical activities of the heart clinic outpatients of Zanjan city were low, and encouragement for more physical activity should be at the top of public heath programs in this region. Even though our study focused on adults, perhaps it is more important to target school children, amongst whom a change of attitude is easier to achieve.

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Conflict of Interest

No conflicts of interest have been claimed by the authors.

References

1. Critchley JA, Capewell S. Prospective cohort studies of coronary heart disease in the UK: a systemic review of past, present and planned studies. J Cardiovasc Risk 2003 (Apr); 10(2): 111-9.

2. Leon AS, Connett J, Jacobs Jr, Raurama R. Leisure- time physical activity levels and risk of coronary heart disease and death. The Multiple Risk Factor Intervention Trial. JAMA 1987; 258 (17): 2388-95.

3. Johansson S, Rosengren A, Tsipogianni A, Ulvenstam G, Wiklund I, Wilhelmsen L. Physical inactivity as a risk factor for primary and secondary coronary events in Goteborg, Sweden. Eur Heart J 1998; 9: 8-19(suppl).

4. Salonen JT, Slater JS, Tuomilehto J, Raurama R. Leisure time and occupational physical activity: risk of death from ischemic heart disease. Am J Epidemiol 1988; 127 (1): 87-94.

5. Berlin JA, Colditz GA. A meta-analysis of physical activity in the prevention of coronary heart disease. Am J Epidemiol 1990; 132 (4): 612-28.

6. Bucher HC, Raglan DR. Socioeconomic

indicators and mortality from coronary heart disease and cancer: a 22 year follow-up of middle – aged men. Am J Public Health 1995; 85 (9): 1231-6.

7. Kunst AE, Groenhof F, Andersen O, et al. Occupational class and ischemic heart disease mortality in the United States and 11 European countries. Am J Public Health 1999; 89 (1): 47-53.

8. Hemingway H, Shipley M, MacFarlane P, Marmot M. Impact of socioeconomic status on coronary mortality in people with symptoms, electrocardiographic abnormalities, both or neither: the original Whitehall study - 25 year follow up. J Epidemiol Community Health 2000; 54 (7): 510-6.

9. Saloma V, Niemela M, Miettinen H, et al. Relationship of socioeconomic status to the incidence and prehospital, 28-day, and 9-year mortality rates of acute coronary events in the FINMONICA myocadial infarction register study. Circulation 2000; 101 (16): 1913-18.

10. Winkleby M, Jatalis DE, Frank E, Fortmann SP. Socioeconomic status and health: how education, income and occupation contribute to risk factors for cardiovascular disease Am J Public Health 1992; 82 (6) 816-20.

11. Luepker RV, Rosamond WD, Morphy R, et al. Socioeconomic status and coronary heart disease risk factor trends. The Minnesota heart survey. Circulation 1993 Nov; 88 (suppl) : 2172-9.

12. Garrett N, Brasure M, Schmitz K, et al. Physical inactivity direct cost to a health plan. American Journal of Preventive Medicine 2004 Nov; 27 (4): 304-9.

13. MacAvley D, McCrum EE, Stott G, et al. Physical activity, physical fitness, blood pressure and fibrinogen in the Northern Ireland health and activity survey. J Epidemiol Community Health 1996; 50 (3): 258-63.

14. Thompson PD, Tsongalis GJ, Seip RL, et al. Apolipoprotein E genotype and changes in serum lipids and maximal oxygen uptake with exercise training. Metabolism 2004 (Feb); 53 (2): 193-202.

15. Koenig W, Sund M, Doring A, Ernst E. Leisure-time physical activity but not work–related physical activity is associated with decreased plasma viscosity - results from a large population sample. Circulation 1997; 95 (2): 335 – 41.

16. Burchfiel CM, Sharp DS, Curb JD et al. Physical activity and incidence of diabetes: Honolulu heart program. Am J Epidemiol 1995; 141 (4): 360-8.

17. Perry IJ, Wannamethee SG, Walker MK, Thomson AG, Whincup PH, Shaper AU. Prospective Study of risk factors for development of non-insulin dependent diabetes in middle-aged British men. BMJ 1995; 310 (6979): 560-4

18. Manson JE, Nathan DM, Krolewski AS, Steampfer MJ, Willett WC, Hennekens CH. A prospective study of exercise and incidence of diabetes among US male physicians. JAMA 1992; 268 (1): 63-7.

19. Eriksson KF, Lindgarde F. Prevention of type 2 (non–insulin dependent) diabetes mellitus by diet and physical exercise. The 6-year Malmo feasibility study. Diabetologia 1991; 34 (12): 891-8.

20. Pan XR , Li GW, Hu YH, et al. Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes study. Diabetes Care 1997; 20 (4): 537-44.

21. NIH Consensus Development Panel on Physical Activity and Cardiovascular

Health. NIH Development Panel on Physical Activity and Cardiovascular Health. JAMA 1996; 276: 241-6.

22. Gang HU, Jousilahti P, Borodulin K, et al. Occupational, commuting and leisure–time physical activity in relation to coronary heart disease among middle– aged Finnish men and women. Atherosclerosis 2006; 9649: 1-8.

23. Huapanen N, Miilunpalos, Vuori I, Oja P, Pasanen M. Association of leisure time physical activity with the risk of coronary heart disease, hypertension and diabetes in middle–aged men and women. Int J Epidemiol 1997; 26: 739-47.

24. Hakim AA, Curb JD, Petrovitch M, et al. Effects of walking on coronary heart disease in elderly men: the Honolulu heart program. Circulation 1999; 100: 9-13.

25. Manson JE, Hu FB, Rich – Edwards JW, et al. A prospective study of walking as compared with vigorous exercise in the prevention of coronary heart disease in women. N Engl J Med 1999; 341: 650-8.

26. Sesso HD, Paffenbarger Jr RS. Physical activity and coronary heart disease risk in men: the Harvard Alumni Health study. Circulation 2000; 102: 975-80.

27. Lee IM, Sesso HD Paffenbarger Jr RS. Physical activity and coronary heart disease risk in men: does the duration of exercise episodes predict risk? Circulation 2000; 102: 981-6.

28. Manson JE, Greenland P, Lacroix AZ, et al. Walking compared with vigorous exercise for the prevention of cardiovascular events in women. N Engl J med 2002; 347: 716 -25.

29. Tanusescu M, Leitzmann MF, Rimm EB, et al. Exercise type and intensity in relation to coronary heart disease in men. JAMA 2002; 288: 1994-2000.

30. Folsom AR, Arnett DK, Hutchinson RG, et al. Physical activity and incidence of coronary heart disease in middle – aged women and men. Med Sci Sports Exerc 1997; 29: 901-9.

31. Wagner A, Simon C, Evans A, et al. Physical activity and coronary event incidence in Northern Ireland and France: the Prospective Epidemiological Study of Myocardial Infarction (PRIME). Circulation 2002; 105: 2247-52.

32. Hu G, Qiao Q, Silventoinnen K, et al. Occupational, commuting, and leisure–time physical activity in relation to risk for type 2 diabetes in middle–aged Finnish men and women. Diabetologia 2003; 46: 322-9.

33. Hu G, Pekkarinen H, Hanninen O, et al. Commuting, leisure-time physical activity, and cardiovascular risk factors in China. Med Sci Sports Exerc 2002; 34: 234-8.

34. Hu G, Pekkarinen H, Hanninen O, Tian H, Goo Z. Relation between commuting, leisure time physical activity and serum lipids in a Chinese urban population. Ann Hum Biol 2001; 28: 412-21.

35. Sundquist K, Quist J, Johansson S. The long –term effect of physical activity on incidence of coronary heart disease. A 12-year follow–up study. Preventive Medicine 21 (2005): 219 – 225.

36. Hu G, Sarti C, Jousilahti P, et al. Leisure time, occupational, and commuting physical activity and the risk of stroke. Stroke 2002; 36: 1994-9.

37. Koezuka N, Koom M, Allison K, et al. the relationship between sedentary activities and physical activity among adolescents. Results from the Canadian

community health survey 2006.

38. Capersen CJ, Merritt RK. Physical activity trends among 26 states. 1986 – 1990. Med Sci Sports Exerc 1995; 27: 713 – 20.

39. Allied Dunbar, Health Education Authority, Sports Council. Allied Dunbar National Fitness Survey: a report on activity patterns and fitness level. Main findings and summary document. London: Sports Council, Health Education Authority, 1992.

40. Stephens T, Caspersen CJ. The demography of physical activity. In: Bouchard C, Shepherd RJ, Stephens T, (eds.). Physical activity, fitness, and health: international proceedings and consensus statement. Champaign, IL: Human Kinetics 1994: 204 – 13.