

Running to Health, Sports and Medicine, A Winning Combination: Implementing Physical Activity to Fight Against Chronic Diseases

Filomena Pietrantonio¹ and Luca Traini²

¹Internal Medicine Unit Director, Manerbio Hospital, ASST Garda, Italy,

²Proposal Development Officer Save the Children Italia Onlus, Rome, Italy

Abstract

Background: Special knowledge in sports medicine inside Internal Medicine could enhance health and fitness preventing injuries and illnesses. Exercise role in promoting healthy lifestyle is essential to prevent most diseases through healthy lifestyle, including diet and lack of risky attitudes (smoking, alcohol) with early detection of age-related diseases. Moreover, according to the World Health Organization (WHO) disability classification ICF (International Classification of Functioning, Disability and Health) that adapt activities and environment to people's abilities, the interest towards physical activity (PA) adapted to health patients' status is increasing.

Methods: A 2014 pilot study on 157 athletes was performed to evaluate the impact of lifestyle on health administering a questionnaire (CRF) combining BMI, physical activity (weekly frequency per duration) and quality of food (evaluated considering the effect on metabolism and food combination).

Results: 135 questionnaires were evaluated: M 76%/F 21%. 74% of the sample showed regular BMI and 16% was overweight. Regular PA was performed by 84% and 69% considered good their dietary habits. PA benefits on health can be extended also to patients with chronic diseases (NCD) according to scientific consensus for a continuous dose-response relationship between PA and health benefits.

Conclusion: A correct lifestyle correlate with a better health status. Lower risks of cardiovascular disease have been observed with just 45–75 minutes of walking per week. The practice of Adapted Physical Activity for patient with disabilities due to NCD could be a valid starting point together with balanced diet for risk reduction in secondary prevention.

Background

Chronic diseases' impact on mortality and morbidity is growing worldwide. They are mainly due to cardiovascular diseases and cancer for the progressive reduction of problems related to predictable risks (particularly infective diseases) [1].

The epidemiological transition – the change of diseases' impact on health – has brought a considerable change in the international health context.

During the 20th century, heart disease, cancer, and other chronic conditions assumed more dominant roles, although outbreaks of infectious disease—from eastern equine encephalitis (1938) and kuru (1957) to legionnaires' disease (1977), AIDS (1981), and multidrug-resistant tuberculosis (1993)—necessitated ongoing vigilance against microbes.

Regardless of the metric chosen, any map of the burden of disease expose disparities within and among populations. Two aspects of the burden of disease have remained particularly vexing: changes over time in the prevailing diseases and the persistence of health inequalities.

By examining the many new diseases that have appeared over the past two centuries, historians have categorized the ways in which diseases emerge. New causes (e.g., severe acute respiratory syndrome, motor vehicle accidents, radiation poisoning), new behaviors (cigarette smoking, intravenous drug use), and even the consequences of new therapies (insulin transforming the course and manifestations of diabetes) can produce new diseases. The interaction between the biologic and the social is equally apparent in the decline of a disease.

Publication History:

Received: May 23, 2016

Accepted: December 12, 2016

Published: December 14, 2016

Keywords:

Chronic diseases, Physical activity, Healthy lifestyle, Cardiovascular Diseases

In this context appears of increasing interest the issue of Non Communicable Diseases (NCD) prevention with actions on lifestyle, diet, weight control, stop smoking and drinking alcohol [2,3].

To evaluate the potential impact of correct lifestyle on chronic diseases burden and progression an observational study was realized on a sample of athletes through the submission of a questionnaire in order to analyze the anthropometric data, diet, alcoholic and smoking habits and physical activity (PA). The athletes sample was chosen to observe a group of people surely committed to a correct lifestyle. We tried to extract a combined index (BMI plus diet plus PA) to be checked afterwards on patients with chronic diseases.

Materials and Methods

In order to assess the impact of lifestyle on Non Communicable Diseases burden a pilot study was conducted on an athletes sample during the Strafadoi races in Lazio region: The same questionnaire (CRF) was administered to a total of 157 athletes during 3 races in 2014. CRF was realized to identify, through a composite index, modifiable risk factors that cause NCD, and taking into account: weight, diet and physical activity. Weight was measured using Body Mass Index (BMI) according to the World Health Organization (WHO)

***Corresponding Author:** Dr. Filomena Pietrantonio, Internal Medicine Unit Director, Manerbio Hospital, ASST Garda, Italy, Tel: +39 3291710748; Fax +39 065089501; E-mail: filomena.pietrantonio@gmail.com

Citation: Pietrantonio F, Traini L (2016) Running to Health, Sports and Medicine, A Winning Combination: Implementing Physical Activity to Fight Against Chronic Diseases. Int J Community Fam Med 1: 122. doi: <https://doi.org/10.15344/2456-3498/2016/122>

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stratification, physical activity as weekly frequency and average activity duration. Foods were evaluated qualitatively enhancing their effect on metabolism and food combination.

Questionnaire (CRF)

The survey collected data, medical history, lifestyle, diet, diseases and treatment information about athletes. The research tool to define the nutritional status was a questionnaire containing items listed in Table 1.

The questionnaire was administered before 3 races held in Lazio during 2014: Strafadoi, Caffarella Cross, Per Antiqua Itinera races with the collaboration of the race organization committee and a preventive increased awareness on the lifestyle issue among the participants.

- 1) General information □ age, sex;
- 2) Socio-economic data □ income, job, type of activity, employment sector;
- 3) Clinical features □ weight, height, abdominal circumference, blood pressure, heart rate;
- 4) Dietary habits;
- 5) Individual perception of lifestyle and dietary habits effects on health;
- 6) Anthropometric data □ BMI;
- 7) Diseases and drugs or other treatment.

Table 1: CRF items.

Results

The administered questionnaires were 157, evaluated 135. Male: 76% and female 21% (table 2); mean age was 43,5 years; BMI was regular in 74% of the sample, 16% was overweight and 4% underweight . Regular physical activity was performed by 84% of the sample and 34,48 % was performing PA every day. The athletes sample was constituted by middle-aged (46 years average) and employed people (85%) and only 9% retired. The nutrition habits were considered good by the majority of the sample (69%) (table 3).Only 3% of the sample was taking pharmacological treatment. (The results are shown in figures from 1 to 6).

General information		
Men	102	76%
Women	29	21%
Unknown	4	3%
Mean age	46,57	0%
Job		
Employed	115	85%
Retired	12	9%
Other (unemployed, student, unknown)	8	6%
Do you consider good your diet?		
Yes	93	69%
No	28	21%
Unknown	14	10%

Table 2: Sinoptic table of sample characteristics.

Do you practice sport regularly?		
Yes	113	84%
No	5	4%
Unknown	17	13%
How many times do you practice sport per week?		
Almost every day (6/7 days)	33	24%
Some days (3/4/5 days)	83	61%
Few days/Week end (1/2 days)	2	1%
Unknown	17	13%
Body Mass Index		
Normal range	100	74%
Overweight	22	16%
Underweight	5	4%
Unknown	8	6%

Table 3: Items related to healthy status.

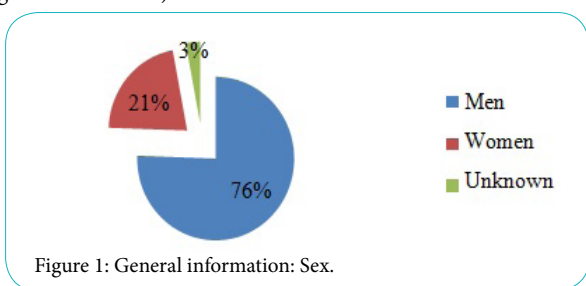


Figure 1: General information: Sex.

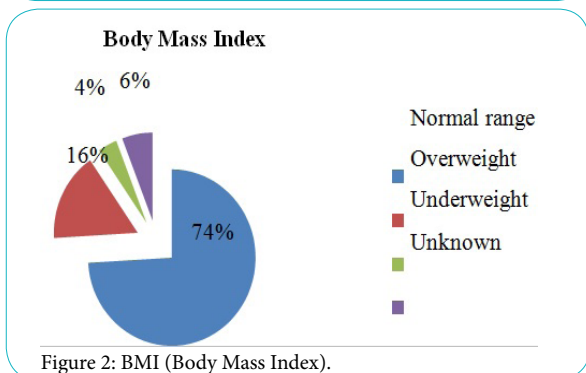


Figure 2: BMI (Body Mass Index).

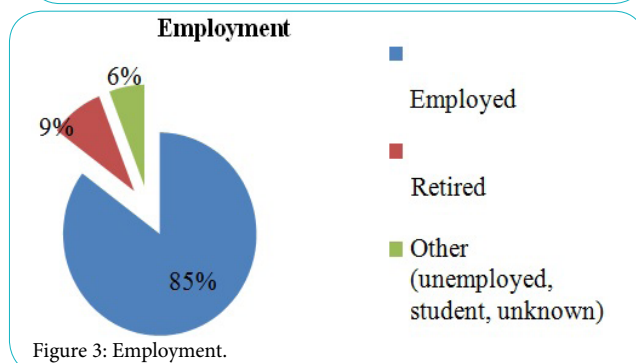


Figure 3: Employment.



Figure 5: Regularly exercise.

How many times do you practice sport per week?

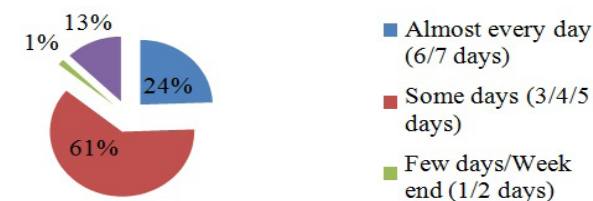


Figure 6: Weekly activity.

Discussion

In 1859 Charles Darwin suggested with the evolution theory that fitness was critical in the evolution of the species.

A recent article published in the New England Journal of Medicine [4] underlines the correlation between lifestyle and dietary habits, and morbidity and mortality due to chronic diseases.

Risk factors such as smoking, alcohol consumption, excess weight, and dietary factors are responsible for a large share of the global disease burden, directly or through conditions such as high blood pressure and elevated blood glucose and cholesterol levels [5].

Being physically active is one of the most important steps that Americans can take to improve their health. The 2008 *Physical Activity Guidelines for Americans* recommends that adults participate in at least 2 hours and 30 minutes (150 minutes) a week of moderate-intensity aerobic physical activity and at least two or more times a week of muscle-strengthening activities for health benefits. For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate intensity[6]. Children and adolescents should practice 1 hour (60 minutes) or more of physical activity daily.

People who are physically active generally live longer and have a lower risk for heart disease, stroke, type 2 diabetes, depression, and some cancers. Physical activity can also help control weight. However, only about half of adults and less than a third of youth meet aerobic physical activity guidelines[7].

Chronic Diseases are strongly connected to lifestyle, especially the use of tobacco, unhealthy diet habits, physical inactivity, and psychosocial stress. The World Health Organization (WHO) has stated that over three-quarters of all cardiovascular mortality may be prevented with adequate changes in lifestyle. Chronic Diseases prevention, remaining a major challenge for the general population, politicians, and healthcare workers alike, is defined as a co-ordinated set of actions, at public and individual level, aimed at eradicating, eliminating, or minimizing the impact of Chronic Diseases and their related disability. The bases of prevention are rooted in epidemiology and evidence-based medicine and has to be promoted by Internal Medicine Specialists as a starting point in the treatment of Chronic Diseases[8]. Table 4 shows the factors that affects longevity.

In 2011 FADOI (Federazione delle Associazioni di Medicina Interna Ospedaliera) conducted a retrospective study in partnership with ISS (Istituto Superiore di Sanità) that highlighted the possible

positive effect of physical activity among 20-40 years old people as primary prevention of cardiovascular events.

Lifestyle	50%
Environment	20%
Genetic heritage	20%
Healthcare	10%

Table 4: Factors that affect longevity.

The study involved 2191 patients between 65 and 75 years that were hospitalized in Internal Medicine ward: data were collected from medical records and patients' history.

Then, in order to evaluate physical activity, the research team submitted questionnaires about physical activity, sedentary level of work, spare time and daily routine.

Results shows that 44,2% of patients have conducted moderate/intense physical activity between 20 and 40 years old. 35,8% have had at least a relevant cardiovascular problem, while the tendency of cardiovascular disease is slightly lower for patients with good physical activity history (average risk decrease: 4% with multivariate analysis) Most relevant positive effects have been found in diabetic patients: based on the multivariate analysis, those who had an active life have 24% lower cardiovascular disease risk than those who had a sedentary life [10].

International Classification of Functioning, Disability and Health (ICF) and Adapted Physical Activity (APA). ICF was approved by the World Health Assembly on May 22, 2001[11] and has changed the point of view of considering disability. Functioning and disability are viewed as a complex interaction between the health condition of the individual and the contextual factors of the environment as well as personal factors. All aspects of a person's life (development, participation and environment) are incorporated into the ICF instead of solely focusing on his or her diagnosis. Diagnoses are important for defining the cause and prognosis, but identifying the limitations of function is often the information used to plan and implement interventions[12]. Once a rehabilitation team is aware of the daily activities, a client is required to participate in, the problem solving sequence set up by the ICF can be utilized[13]. Following ICF principles, the Adapted Physical Activity (APA) [14] was introduced as exercise programs addressed to groups of persons with chronic diseases that deduce physical capacity, in order to modify lifestyle and strengthen secondary and tertiary prevention of disabilities. Adult/elderly citizen with low disability can start with Adopted Physical Activity (APA) upon medical advice while those with high disability need a preliminary psychiatrist evaluation.

Conclusions

The study performed on an athletes sample showed the benefits of PA on health. The majority of the sample showed a normal BMI, correct dietary habits and no need of pharmacological treatment. Exercise is one of the mainstay clinical interventions for the prevention and treatment of cardiovascular diseases. Not only, exercise reduce cardiovascular risk factors, such as diabetes mellitus and hypertension,

thereby helping to prevent heart disease, it also appears to improve the functional status and outcomes in patients with existing heart disease. The cardiovascular benefits of exercise are multifactorial, and include important systemic effects on skeletal muscle, peripheral vasculature, and metabolism, as well as beneficial alterations within the myocardium itself [15]. Exercise is perhaps one of the cheapest and most effective-interventions for reducing the morbidity and mortality of cardiovascular disease[16. In fact, as little as 45 to 75 minutes of brisk walking each week appears to reduce the relative risk for adverse cardiac events [17,18,19]. The preliminary results of this study suggest that increasing physical activity could prevent the burden of NCD, acting on primary prevention and even in patients with disabilities due to NCD Adapted Physical Activity could be a valid starting point together with balanced diet for risk reduction in secondary prevention.

Competing Interests

The authors declare that they have no competing interests.

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