

Diet and physical activity – interactions for health; public health nutrition in the European perspective

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Abstract

For the majority of European adults, who neither smoke nor drink excessively, the most significant controllable risk factors affecting their long-term health are what they eat, and how physically active they are.

Scientists are supposed to clarify to policy makers and health professionals the usefulness of their health messages. However, to be able to do that, a more detailed understanding is needed of the basic mechanisms behind the effects on health of diet and physical activity and, especially, the two in combination. Further, better methods for assessment of nutrition and physical activity in the population have to be developed, and more and better baseline data have to be collected. Increased and more efficient interventions are then needed. People trained and competent in the new discipline of Public Health Nutrition are required.

Through the stimulating support that the European Commission, as well as other national and international partners, are presently giving to the development of Public Health Nutrition across Europe, we can hope for an increased mobility, networking and understanding between European nutrition and physical activity professionals. This will most likely result in greater and better policy making, strategy development, implementation and evaluation. We now have a great possibility to develop the integrated field of preventive nutrition and health enhancing physical activity.

Keywords

Diet

Nutrition

Physical activity

Health promotion

Disease prevention

Assessment

Policy making

Interventions

Evaluation

Training

Key messages

- Today's structure considers nutrition and physical activity as two different specialties as a result of history rather than of logic.
- For the majority of adults in Europe, what they eat, and how physically active they are, are the most significant controllable risk factors.
- WHO, EU, national authorities, networks, etc. are on the right track.
- A problem is insufficient understanding amongst scientists and health professionals of the dialectic role of both communication and control and how messages and the efficient communication of these messages fit within these dialogues.
- A number of pan-European projects stimulate the development towards more effective implementation.
- European Master's Programmes increase networking and understanding between nutrition and physical activity professionals.
- Never before has the potential to develop the integrated field of public health nutrition been so great.

- Be active; read the information on internet and talk to your country representatives in the Health Promotion Committee

Introduction

Historically, the science of medicine has differentiated into various specialities based on disease categories, organs in the human body, age, gender, special techniques or medical setting. Current health care systems, international organisations, medical education, research and patient organisations are still deeply embedded in this structure and remain to be served reasonably well by it.

However, this organisational structure, which may convey the impression of territorialism, also represents a major barrier to collaborative efforts between the different disciplines. Yet it is the very interdisciplinary approach that may be critical for the success of research and developmental work, as well as for securing funding, especially in health promotion and disease prevention. Primary prevention directed at risk factors for cardiovascular disease often depends on

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experts from diverse areas such as behavioural medicine, nutrition, physical activity and epidemiology. That today's structure still considers (clinical) nutrition and physical activity (exercise physiology/orthopaedics) as two different medical specialities, is a result of history rather than of logic. It is hardly optimally suited for today's needs in health promotion and disease prevention. Preventive research will never reach its full potential until a more holistic view is adopted.

The collaboration between experts has certainly increased. Public Health exemplifies such a multidisciplinary approach to promotion and prevention research, capitalising the variety of available expertise but, there is still much room for improvement. This article focuses on *Public Health Nutrition*, a relatively new speciality, which embraces the promotion of good health through nutrition and physical activity and the prevention of related illness in the population. The links between diet and physical activity and their combined impact on health is a central issue for this rapidly growing multidisciplinary speciality.

Health in Europe

The WHO report, *Health in Europe 1997*, reveals that Europe's overall health is deteriorating for the first time in 50 years¹. It shows that average life expectancy across Europe has fallen for the first time since the Second World War. The reason for the fall is the social and economic upheaval in the Newly Independent States of the former Soviet Union and in the countries of Central and Eastern Europe (some of which will become Member States of the European Union in the near future).

However, the report states that even among the 15 countries of the European Union (EU) there is little room for complacency. Life expectancy seems to approach limits for improvements in some countries, especially in the North. The top health problems, cardiovascular disease, obesity, diabetes, osteoporosis and cancer, share the common risk factors – unhealthy nutrition, lack of physical activity, smoking and heavy drinking. Lifestyle-related diseases are now the leading causes for years of life lost in Europe as well as in the rest of the World^{1,2}.

For the majority of adults in Europe, and especially those in the EU, who neither smoke nor drink excessively, what they eat, and how physically active they are, are the most significant controllable risk factors affecting their long-term health. In the WHO, Geneva, report about obesity³, for example, it is stated that the fundamental causes of the obesity epidemic are societal, resulting from an environment that promotes sedentary lifestyles and the consumption of high-fat energy-dense diets.

Diet and physical activity and their interactions for health

- *Diet* is a combination of food choice and meal patterns depending on availability, affordability and cultural factors. Food is essential for sustenance, growth and development, but also for health, and well being. Nutritional (dietary) factors contribute substantially to the burden of preventable illness and premature death and hence to the economic burden of countries^{3–6}. Protecting agents in different foods, e.g. vegetables and fruits, are of substantial importance for health. The adoption and maintenance of a healthy diet is essential for a healthy life.
- *Physical activity* is any bodily movement produced by skeletal muscles that results in energy expenditure⁷. Physical activity is closely related to, but distinct from, exercise and physical fitness. It depends on factors like availability, affordability and cultural factors, as well as safety and environmental factors. Physical activity has protective effects for several chronic diseases such as cardiovascular diseases including hypertension, obesity, non-insulin dependent diabetes mellitus, osteoporosis, some types of cancer, as well as depression and anxiety. The adoption and maintenance of a physically active lifestyle is essential for a healthy life^{7–10}.

Diet and physical activity, while possessing opposite qualities, as far as energy metabolism is concerned, work together to produce health. However, our insight into the underlying mechanisms for this combined effect is relatively meagre. We need a much better understanding of the basic biological and pathophysiological processes, and as well as more relevant baseline data describing present food and, especially, physical activity habits amongst the general population (Table 1). We also need to find better systems for identifying supporting and limiting factors for change, from a policy as well as a consumer point of view.

Such an understanding is of the utmost importance as there is an urgent need for a solid basis for clear and useful messages to be handed over from the basic scientists and epidemiologists to the policy makers and public health professionals working in the field of health promotion.

Who does what?

A number of international organisations, governmental and non-governmental organisations and networks are actively supporting or directly involved in the research and the development of the applied promotive/preventive work.

Table 1 Urgent tasks for basic research and epidemiology in the field of public health nutrition

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- Better understanding of the underlying pathophysiological mechanisms
 - Role of nutrition, energy balance
 - Amount and type of physical activity/exercise
 - Interaction of nutrition and activity
 - Relevant and comparable epidemiological data
 - Development of assessment methods, in nutrition and activity
 - Amount and intensity of physical activity, urgently needed
 - Day, week, year
 - Age groups, gender, socio-economic status, ethnicity
 - Anthropometric variables, individuals at special risk
 - Surveillance systems monitoring
 - Local, regional, national, international
 - Relation to other determinants of health
 - Poverty
 - Equity
 - Environment
-

WHO

Nutrition and physical activity are listed under the same Target 11 (Healthier Living) in the WHO Health for All Policy Framework for the European Region (Health 21)¹¹. Suggested areas for formulation of indicators include:

- National statistics on food consumption and body mass index.
- Data on estimates of physical activity and sexual behaviour.

Although both disciplines are combined under the same target in Health21, nutrition has long been under the domain of Lifestyles and Health, whilst physical activity was placed under Health Promotion. A more integrated structure in the organisation would increase awareness of the need for a combined approach amongst researchers and policy makers. Visibility of these two disciplines has not been optimal but there are positive signals.

At the World Health Organisation's Executive Board meeting in Geneva, January 1999, the new Director-General, Dr Gro Harlem Brundtland, highlighted some areas, which will receive particular attention. Above all she said: "We need to step up our ability to deal with the rising toll of non-communicable diseases and to develop and test preventive strategies. Special attention will be given to cancer and cardiovascular disease." Much may remain undone until WHO Euro have enough funding to support their units working with nutrition and physical activity, so they can adequately match the many expectations. The statement is, however, a positive "Be active!" signal to all in the field of Public Health Nutrition, but also to the Member States as well as many national, regional and local health authorities.

The obesity epidemic, to take another example, is

considered by WHO to be so serious that public health action is required urgently³. Obesity should be regarded as today's most neglected public health problem and future action can not only concentrate on those already overweight, but societal changes in both areas of nutrition and physical activity are definitely needed. To accomplish that, skilled public health staff have to be trained, and useful methods for monitoring of obesity, physical activity and nutrition have to be further developed for use on population level. Effective methods for interventions need to be refined and evaluated, and most importantly, decision makers have to become aware that obesity is and will be an even bigger problem if long-term funding is not provided for action.

EU

The European Union is a partner with great potential. It was not until 1993, when the Maastricht Treaty on the EU came into force, that the Community gained a specific mandate in public health.

The responsibility of public health programmes for the period 1996–2000, falls under Directorate-General V (DG V). Directorate DG V/F covers public health, and Unit 3 within it is responsible for Health Promotion, Health Monitoring and Injury Prevention. In the intervening years, this Unit (DG V/F/3) has become an important factor in the development of the field of public health in general, and in public health nutrition in particular. This was accomplished by setting up networks, applied research, evaluation and training, etc. Some examples are given in Table 2. Diet, physical activity, body weight and cardiovascular disease are all priority issues in the Health Promotion Programme.

A Health Promotion Committee, consisting of two representatives from each of all the Member States and the European Economic Area (EEA) countries meet

Table 2 Activities (examples) in public health nutrition at European level, by support from the EU Commission if not otherwise stated

● National policies, and plans of action “Nutrition and Diet for healthy Lifestyles in Europe” EU Framework for Public Health 2000 to 2005 WHO Health 21 – The Health for All Policy Framework (WHO)	http:// or e-mail europa.eu.int/comm/dg05/phealth/hp/page5.html europa.eu.int/comm/dg05/phealth/general/policyen.pdf www.who.dk/cpa/h21/h21long.htm
● European monitoring projects EPIC – European Investigation into Cancer and Nutrition DAFNE – Data Food Networking COST99 – Food balance sheets, also supported by FAO and OECD Pan-European surveys of consumer attitudes to food, nutrition and health physical activity, body weight and health	www.iarc.fr/pageroot/units/ntr.htm antonio@nut.uoa.gr Clive.West@STAFF.NUTEPI.WAU.NL
● European training projects European Master's Programmes in Public Health Public Health Nutrition, Health Promotion, Public Health, Gerontology	www.cordis.lu/ireland/src/tcd337.htm
● European Public Health Networks (examples) ENHPPA European Network of Health Promotion Agencies EUPHA European Public Health Association EPHA European Public Health Alliance IUHPE European Section of Int Union Health Promotion and Education ASPERH Association of Schools for Public Health in Europe ENPHN European Network for Public Health Nutrition HEPA Health Enhancing Physical Activity Network Health Promoting Schools, also supported by WHO Workplace Health Promotion Healthy Cities, WHO supported Health Promotion in Capital Cities (Megapol) International Obesity Task Force WHO supported European Heart Network	www.nigz.nl/enhpa/enhpa.html www.nivel.nl/eupha/ www.epha.org/ www.nigz.nl/wwwiuhpe.html www.ensp.aspher.fr www.prevnut.ki.se www.europe-on-the-move.nl/ www.who.dk/ www.baua.de/whp-net/ www.who.dk europa.eu.int/comm/dg05/phealth/hp/hp98indx.htm www.who.dk EHN@compuserve.com

twice a year to discuss the Work Programme and give their opinion on projects selected for funding.

In the new framework for public health, some important areas have been highlighted for the period 2000–2005. These include:

1. improving information for the development of public health;
2. reacting rapidly to health threats;
3. tackling health determinants through health promotion and disease prevention.

Numbers 1 and 3 especially seem to relate to nutrition and physical activity. However, a word of caution, reorganisation of the work within the Commission could introduce an element of insecurity to the future development of public health matters in the European Union. Public Health, which essentially means DG V/F/3, may be moved to DG XXIV, the consumer directorate.

In the very near future, the first of the Accession Candidates to the EU, i.e. Czech Republic, Estonia, Hungary, Poland, Cyprus and Slovenia, will enter the Union. Concerted efforts to decrease life-style related diseases, especially cardiovascular disease and mortality, will be of high importance. CVD is the main cause for the existing gap in total life expectancy between all the candidate countries and the EU¹². Demographic changes, especially ageing of the population, will put

substantial pressure on health care provision in the near future. Introducing these countries into public health work within our remits is also of importance to strengthen already ongoing collaboration.

Direktorate-General XII (DGXII) is responsible for research. The Fifth Framework Programme for Research, technological development and demonstration activities for the period 1998–2002 (call for proposals released March 6th 1999) has Food, Nutrition and Health as the first of its Key Action points. One area of interest in this Action is “Role of food in promoting and sustaining health with respect to diet and nutrition, toxicology, epidemiology, environmental interaction, consumer choice and public health” (Table 3), which coincides very well with the areas for action in Public Health Nutrition.

There are also other Key Actions to enhance the understanding of shared cellular and molecular mechanisms of diseases (Key Action 7), and Public Health (Key Action 10). The amount of funds available for research projects is huge. We now have a unique possibility “to improve our understanding and awareness of the role of nutrition, diet and lifestyle in promoting and sustaining health and preventing disease, to support consumer choices for healthy and wholesome foods, and to facilitate the development and understanding of health promotion products and diets” (from the Work Programme).

Unfortunately, physical activity is not mentioned

Table 3 The EU Fifth Framework Programme; Key Actions focused on aspects of Public Health Nutrition*

Key Action 1: Food, Nutrition and Health
1.3. Research into the role of food in promoting and sustaining health with respect to diet and nutrition, toxicology, epidemiology, environmental interaction, consumer choice and public health
1.3.1. Role and impact of food on physiological functions, physical and mental performance
1.3.2. Particular nutritional needs of defined population groups
1.3.3. Links between diet and chronic diseases and disorders including the genetic factors involved
1.3.4. Consumer attitudes and reactions with regard to food products , food processing and labelling
Key Action 7: Chronic and Degenerative Diseases, Cancer, Diabetes, Cardiovascular Diseases and Rare Diseases
7.1. Aetiology, pathophysiology, progress and outcome of diseases
7.2. Evaluation of therapies through multinational, large scale studies/trials
7.3. Optimised use of databases, registries, reagents and sample banks
Key Action 10: Public Health and Health Services Research
10.1. Public health research, health services research and health and safety

*More detailed information to be found at <http://www.cordis.lu/fp5/>

explicitly amongst the objectives of the Fifth Framework Programme.

All EU Member States have a national nutrition policy and/or action plan in nutrition, whilst some also have it for physical activity. Only a few have developed the interdisciplinary approach of diet and physical activity. An example of such an approach is Norway, where The Norwegian National Council on Nutrition and Physical Activity was just recently inaugurated. The Council is a permanent professional and administrative body under the auspices of the Ministry of Health and Social Affairs and is responsible for matters regarding nutrition, physical activity and health. It is organised into two departments, one each for nutrition and physical activity, each comprised of twelve national experts. Their primary objective is to provide advice to and evaluate a wide range of governmental and non-governmental organisations, industry, media and the public/consumers. Substantial funding for the work has been secured.

In Finland an alternative model was chosen, namely a temporary Consensus Commission, for stimulating, supporting and evaluating the promotive work. A statement entitled *Action Plan for Promoting Finnish Heart Health* was launched recently (1998)¹³. The panel behind the statement consisted of representatives from health care, public health, consumer's organisations, as well as scientists and government employees. The action plan includes recommendations on how to

- alter Finnish nutrition in a positive direction,
- increase the population's physical activity level,
- decrease the population's smoking prevalence,
- reduce psychological and social risk factors of diseases,
- increase people's personal responsibility for improving their personal health,
- encourage children and youth to adopt heart healthy lifestyles.

It remains to be seen which of these Nordic

alternatives will stimulate development in the most constructive and fruitful way.

A series of European networks in the field of health Promotion have been established during recent years (Table 2). At a meeting in Las Palmas in February 1999, agreement was reached among representatives from academic centres across Europe to establish a European Network for Public Health Nutrition. A first step was to form an academic consortium. This was initiated through a Declaration of Interest, signed by representatives of those departments (Fig. 1). The network is co-ordinated from the Karolinska Institutet, since the Network stems from the same group that initiated and implements the European Master's Programme in Public Health Nutrition (see below). The network will, when established and consolidated, become open to any other interested centre, department or University.

To conclude so far: The important international organisations are on the right track, whilst funding for research and development is available. We have common and (generally) well-defined recommendations both in the field of nutrition and physical activity to share with the public. In spite of this, health development in Europe is, as previously discussed, not optimal. Why? Why do people not do as we advise them to? The problem is not only the insufficient understanding amongst scientists of the basic physiological processes, but also insufficient knowledge amongst health professionals about how to efficiently communicate needs for action to policy makers as well as messages to the public.

Dr Matti Rajala, Head of DGV/F/3, adds one dimension to the complexity of promotion, by saying: "Behaviours like alcohol consumption, smoking, eating, and physical activity are embedded in a larger social structure that makes changing those behaviours difficult, sometimes impossible, without addressing the social context in which those behaviours occur and making the necessary changes in infrastructures and policies."

We, the undersigned representatives of 18 leading centres of academic excellence throughout Europe, have come together to create the European Network for Public Health Nutrition.

This is in response to the declared priority of the European Commission, that diet and nutrition has the greatest potential for improvement of public health in Europe. The discipline of Public Health Nutrition (PHN) focuses on the promotion of the health of populations through good nutrition, promotion of physical activity, and thus the prevention of heart disease, obesity, diabetes, cancer and other diseases.

Specifically, we have come together to develop a pan-European Masters in Public Health Nutrition, as specified in the enclosed executive summary. We also propose to establish a pan-European Consortium designed to ensure the highest academic standards and to support development of PHN in countries currently without formal Master programmes.

With appropriate recognition and support, the network represented here will be the focal point for sustained research, policy formulation and legislation within PHN in Europe and for increased public understanding of the role of nutrition in health.

Also in response to declared European Commission interest, the PHN programme proposed here will assure comparability and quality assurance across Europe, in methodology and in exchange of students and teachers.

Fig. 1 Declaration of interest, undersigned by 18 academic centres to create a European network in Public Health Nutrition

Health promotion

Health promotion takes place in a broad context. It is defined as any process that enables individuals or communities to increase control over the determinants of their health. It differs from *Health education*, which refers to any learning activity that aims to improve individual's skills, knowledge and attitudes relevant to their health. Health promotion initiatives, therefore, vary widely in their scope and aims.

Traditionally health promotion interventions tended to be characterised by a focus on one-off individualistic, health education interventions with little representation of broader health promotion approaches. Today a need for a more integrated, comprehensive and multi-disciplinary approach has been identified, involving a complementary range of actions that will work at the individual, community, environmental and policy levels. This should be complemented by a multi-disciplinary approach to evaluation that gives as much weight to process activities, (e.g. planning, implementation/delivery, acceptance) as to outcomes (e.g. changes in behaviour) and takes into account the context and practice in which this is set.

Thus far a number of pan-European projects have been initiated to stimulate the development towards more effective implementation (a few examples are shown in Table 2) of an integrated program, but much remains to be done. The pan-European surveys on people's attitudes towards food, nutrition and health, and physical activity, body weight and health are good examples^{14,15}. Policies, recommendations and strategies for implementation have to be developed, especially in the field of physical activity. Only a few countries and regions within these countries have, as mentioned earlier, initiated such a process.

The Commission (DGV/F/3) has, to support such work in the different Member States, funded a project, *Nutrition & Diet for Healthy Lifestyle in Europe*. The aims of the project are to enable a co-ordinated EU and Member State health promotion program on nutrition, diet and healthy lifestyles, which will provide a framework for the development of national food-based dietary targets. This will be accomplished by establishing a network, strategy and action plan for the development of the European dietary guidelines. The work plan has entailed the formation of Working Parties composed of prominent experts from the Member States to prepare consensus documents on the state of the art in Europe and the added value of European guidelines. A conference, to be held in Crete (May 2000), is the culmination of the project. The final report and recommendations will be presented to the European Commission, the Council of Ministers and the European Parliament.

Training

The implementation of effective and combined strategies then requires people trained and competent in the discipline of Public Health Nutrition (PHN). These individuals must be able to be involved in:

- The derivation of scientifically based information about diet that may reduce illness and promote good health, and in promoting an understanding of the potential causal relationships between diet, physical activity and disease.
- The design, the execution, and the assessment of the effectiveness of the modes of delivery of this information appropriate to the population group or subgroup.

Table 4 Long-term results of basic and applied research in Public Health Nutrition in Europe*

Policies and recommendations based on sound scientific evidence
Specific and clear food/nutrient recommendations
Precise activities and exercise methods defined
Interaction for health of diet and physical activity considered
Health promotion strategies to implement the recommendations
Integrated, comprehensive and multidisciplinary approach
Prevailing health and cultural profiles taken into account
Attention paid to specific population sub-groups
Efficient interventions, well-trained and competent health care and public health professionals
Comprehensive surveillance systems running and integrated
Extensive national/international collaborations to strengthening action
EU, incl Central and Eastern Europe and NIS
WHO, incl CEE, NIS and 3rd World

*NB, the European dimensions consequently taken into account!

- The formulation of policy and programmes leading on from an analysis of the results of studies looking at the effectiveness of programmes.

This calls for proper training across Europe, leading to the development of comparably skilled and competent individuals. In order to achieve this, common standards of training should be set and monitored. Through the support that the European Commission is giving to postgraduate training (Master's Programme) in PHN across Europe, we can hope for an increased mobility, networking and understanding between European nutrition and physical activity professionals. The Master's Programme may lead to an accreditation and registration system for European Public Health Nutritionists, similar to the system operated by the Nutrition Society.

We can look forward to a new brand of professionals, who are truly European in their training, but who also have an integrated view of nutrition and physical activity interrelations, possibilities for intervention etc.

Good timing

The workshop *Diet and Physical Activity – Interactions for Health*, Chamonix, March 1999, discussed and evaluated the science base of effects of diet and physical activity, and interactions between these two on health. It also put, at the end, the results into a broader context, i.e. the promotion of healthy food habits and a physically active life using effective population based strategies. It was an interesting challenge and with good timing. We have never

before had so great an opportunity to develop the integrated field of preventive nutrition and health enhancing physical activity.

However, with those possibilities follow increased demands for cost efficiency and positive results (Table 4). This can only be reached through increased specialisation, hard work and collaboration with other professionals as well as with consumers.

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