Role of diet and lifestyle in the prevention of cardiovascular disease: knowledge and attitude of physicians and patients in Southern Italy

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Background. **The present study aimed to investigate the knowledge and attitude of family physicians and their patients respectively in prescribing and adopting lifestyle and dietary changes in order to prevent cardiovascular disease which is the main cause of mortality in the industrialized Western countries.**

Methods. **All physicians working in two suburban areas of Naples and in the city of Avellino were invited to participate in the study and 63% accepted (n = 218). A sample of lay people living in the same areas was randomly selected and 59% accepted (n = 267). Two different questionnaires were used to assess the knowledge and attitudes of physicians and lay people about the role of nutrition and lifestyle in the prevention of cardiovascular risk.**

Results. **Physicians showed satisfactory knowledge and a good attitude to non-pharmacological prevention – particularly secondary prevention – of cardiovascular disease. The opinions of the lay people interviewed on the impact of lifestyle changes on cardiovascular disease prevention were similarly satisfactory although some inconsistencies were noted.**

Conclusions. **In spite of the good propensity of both physicians and their patients to the implementation of lifestyle changes, it appears that dietary modifications prescribed by physicians are not accurately followed or even misunderstood by their patients. This suggests the need of implementing further educational programs.**

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Introduction

Cardiovascular diseases (CVD) still represent the first cause of death in industrialized countries. While a substantial decline in CVD mortality has been observed in Western Europe, United States and Australia, Eastern European and many developing countries are now experiencing a sharp increase in the mortality rates due to CVD[1].

Epidemiological studies[2-4] have clearly shown the efficacy, in terms of increased life expectancy, of preventive strategies aimed at reducing the impact of CVD risk factors. In the light of the recent formulation of the concept of "global risk"[5] – which takes into account the multiplicative effect of all the possible factors independently contributing to the individual risk profile – an increased need for multifactorial, individually tailored prevention strategies is emerging. However, the intervention on "modifiable" risk factors, such as blood pressure, serum lipids, cigarette smoking and sedentary lifestyle, remains the cornerstone for the primary as well as secondary prevention of CVD. The prevalence of these risk factors is generally high in the adult population of many industrialized countries, as is the co-existence of several risk factors in the same individual[6]. Lifestyle and dietary modifications play a unique role in the reduction of modifiable CVD risk factors, as largely stated by the most recent guidelines for the prevention of CVD[5] which definitely acknowledged the relevance of non-pharmacological measures. Although a considerable effort has been made by public health authorities in different countries to promote the model of the "optimal lifestyle"[7,8], little information is as yet available on the results of the various educational ini-

tiatives in terms of modifications achieved in the extent of knowledge and in the attitude towards CVD prevention of both family physicians and the general population. In fact, scientifically sound information regarding these aspects has so far been systematically reported only by US and Finnish studies[9-12]. More recently, a few studies have investigated specific aspects of the problem in other countries[13-15] and, as far as Italy is concerned, to date only limited information is available[16].

The Information & Health Project was designed on the basis of the above-mentioned surveys[9-11] to evaluate the level of knowledge and the personal attitudes of family physicians and adult lay people towards the non-pharmacological management of CVD risk factors in Southern Italy.

Methods

Study setting. The study was performed in Southern Italy and, precisely, in two suburban areas of the city of Naples and in the city of Avellino. Two different questionnaires were used to assess the knowledge and attitudes of physicians and the general population towards the role of nutrition in the prevention of CVD. These questionnaires had been designed on the model of those adopted in the NIH 1990 Health and Diet Survey in the United States[9,10]. They were remodeled taking into account: 1) the need to address not only the issue of hypercholesterolemia and fat intake but also non-pharmacological treatment of high blood pressure; 2) Italian dietary habits and lifestyle. The questionnaires were structured for computer processing.

Both lay people and physicians were invited to participate in the study; the purposes of the investigation were clearly explained and informed consent was obtained from all participants.

Characteristics of the samples. *Physicians.* All the family physicians included in the National Health System master-files of the selected areas, were invited to participate in the study and 218/346 (63%; 180 males, 38 females) accepted. During an *ad hoc* meeting physicians were asked to fill in a questionnaire that comprised 90 questions regarding the management of cardiovascular risk factors. They were informed that replies would remain anonymous. Sixty-one percent of the physicians interviewed were aged between 35-45 years and had therefore graduated within the previous 10-20 years; 63% had a post-graduate degree; 85% had a general practice of 1000 patients or more. Fifty-six percent of physicians were aware of the quality of the referral laboratory used for blood cholesterol analysis. Seventy-six percent of them had their sphygmomanometer checked at least once yearly.

Lay people. A random sample of families (n = 452) was drawn from the telephone directories of the areas under investigation. Two hundred and sixty-seven accepted to participate in the study (59%). The questionnaire was administered in the form of a telephone interview which was performed by trained operators and lasted on average 10 min (range 4-25 min). The interview, consisting of 60 questions, investigated: 1) the level of knowledge of the lay people on the role of nutrition in CVD prevention, and 2) their attitude towards lifestyle changes prescribed by their family physician. In order to obtain a randomly selected sample, the interview was administered to women aged between 18 and 70 years and whose birthday had occurred more recently. We chose to interview women because they are the ones who are more often responsible for the management of food and meals in the family, as was the case in 82% of our interviewees.

On average, participants were aged 42 ± 15 years (mean ± SD). The reported body weight was 63.0 ± 9.5 kg (range 45-100 kg) and height 161.0 ± 11.8 cm (range 147-176 cm). The body mass index, calculated on the basis of reported data, was 24.3 ± 3.6 kg/m^2 (range 17.6-39.1 kg/m^2). With regard to education, 57% had primary school education, 34% secondary school education, and 8% were university graduates; 1% did not answer.

The majority (80%) of the women interviewed had been examined by their physician within the previous 6 months.

Results

Physicians. Physicians felt prepared to provide adequate dietary counseling to their patients. They emphasized the need to check serum cholesterol levels and blood pressure, stressing on every occasion that dietary prescription must also be complied with, even when patients were on drug therapy: however, a large majority admitted that, in this case, the patients' attitude towards their diets was more relaxed. The proportion of physicians who replied that measurement of total, LDL- and HDL-cholesterol is very important to assess CVD risk was 29, 52 and 66% respectively. Serum cholesterol levels < 200 mg/dl were considered as "desirable" by 87% of the sample.

Physicians were then asked to describe their clinical management of a hypothetical 40-60-year-old hypercholesterolemic man without other risk factors for CVD. Fifty-three percent replied that they would start a cholesterol-lowering diet at a serum cholesterol level ≥ 240 mg/dl, and 61% would start drug treatment at a serum cholesterol level ≥ 260 mg/dl. However, 81% of the sample was aware that treatment, whether dietetic or pharmacological, should be started at lower threshold levels in the presence of other coexisting CVD risk factors. Although most physicians also acknowledged the benefits of serum cholesterol reduction in the elderly,

51% of them did not believe that dietary changes after 65 years of age might be useful to prevent CVD.

Physicians were asked to indicate the extent of the effect of single interventions on CVD prevention: the non-pharmacological measures considered as having a highly significant effect were blood pressure control (79%), lowering serum cholesterol (73%), smoking cessation (77%), and body weight reduction (48%). The dietary measures most recommended to prevent CVD were: a reduction in fat intake (48%), a reduction in saturated fat intake (28%), eating less (17%) and a decrease in cholesterol-rich food intake (5%).

A good attitude towards the non-pharmacological treatment of hypertension was also apparent. Most physicians (90%) were aware of the influence of diet on blood pressure and 74% prescribed non-pharmacological therapy as a first-step in the treatment of hypertension. Ninety-one percent of the physicians interviewed stressed the value of dietary measures as often as possible with their patients, even after starting drug therapy; however, as previously reported for the dietary treatment of hypercholesterolemia, most felt that, in the latter case, the attitude of patients towards their diets was more relaxed. A number of dietary approaches were considered effective in lowering blood pressure; in particular reducing the intake of salt (58%) or of canned food (46%), reducing calorie (45%), saturated fat (45%) and alcohol (32%) intake and increasing fruit and vegetable consumption (43%). However, as shown in figure 1, only salt and calorie restriction were indeed stressed by physicians in their therapeutic prescriptions.

The "desirable" goal of antihypertensive treatment, whether dietetic or pharmacological, was on average 142.9/83.4 mmHg (range 120-160/70-100 mmHg). Sixty-five percent considered a systolic blood pressure < 140 mmHg and 97% a diastolic blood pressure < 90 mmHg as "desirable" values.

When physicians were asked to describe their clinical management of blood pressure in a hypothetical 40-60-year-old hypertensive man without other risk factors for CVD, the cut-off values considered as the threshold at which dietary treatment should be started were 160 mmHg (92%) and 95 mmHg (82%) for systolic and diastolic blood pressure respectively.

In spite of a good propensity to treat CVD risk factors by diet, a large proportion of physicians (59%) were concerned with the anxiety derived from the current emphasis and media attention on high blood cholesterol and 21% of them were afraid that a low-cholesterol diet could cause cancer.

Lay people. Table I reports the interviewees' answers to general questions about diet and CVD. With regard to blood cholesterol, 36% of the lay people indicated a blood cholesterol level < 200 mg/dl as "desirable"; however, 59.9% of the women were unable to indicate a specific value. Blood cholesterol had been checked at least once in 71.9% of those interviewed; in about 13% of the cases a high cholesterol value was reported. Only 7.1%

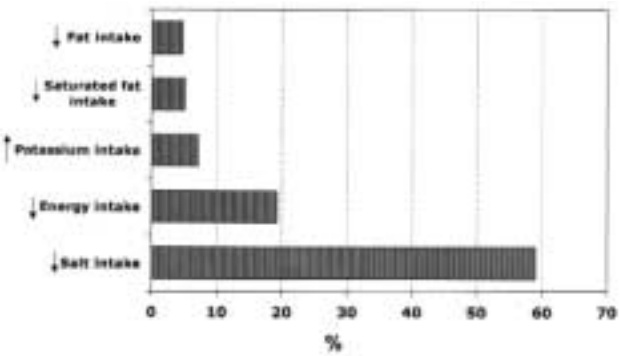

Figure 1. *What is the most stressed dietary measure in your therapeutic prescriptions? Physicians' reply.*

Table I. The following is a list of statements; for each one, please state whether you agree or disagree.

	Agree (%)	Disagree (%)	Don't know (%)
What I eat won't make that much difference to my chances of developing heart disease ...	18.7	74.9	6.4
It is a good idea to eat less saturated fats and to reduce dietary cholesterol ...	95.9	2.6	1.5
Women should pay as much attention as men to cholesterol-lowering diets ...	53.2	38.6	8.2
Making diet changes after the age of 65 probably will not have an effect in preventing heart disease ...	22.8	70.4	6.7
A cholesterol-lowering diet might cause cancer ...	18.0	40.1	41.9
Public interest and concern about cholesterol is exaggerated ...	40.4	53.2	6.4

were prescribed a low-cholesterol diet by their family doctors, the most recommended measures being a reduction in fat and cholesterol intakes. Only hypercholesterolemic patients, however, received dietary counseling.

The opinions of the people interviewed on the impact of lifestyle changes on blood cholesterol levels are reported in table II. Eating fish, poultry and less fat in general, or animal fat in particular, had been considered by almost all those interviewed as effective dietary measures.

Blood pressure was checked at least once in 87.6% of the sample and within the previous 6 months in 70.4%. Most participants (64.8%) had their blood pressure measured at their doctor's office, 15.3% at home and fewer (6%) at the chemist's. Forty-seven subjects (17.6%) reported being hypertensive (blood pressure values > 140/90 mmHg or drug treatment). Most of the participants (89.1%) were aware that diet may affect blood pressure. The dietary components reported as possibly affecting blood pressure are shown in figure 2: as expected, salt was indicated as the most relevant dietary factor affecting blood pressure. Twenty percent of the interviewed was able to reduce their salt intake, while in 16% of cases the attempt to reduce this dietary component had been unsuccessful; 59% of the sample was not concerned about their own salt intake.

Physical activity and smoking habits were also investigated: although 82.4% of participants agreed that habitual physical activity may exert a protective effect on CVD, 80% did not regularly perform physical activity.

Half of the sample declared that they were non-smokers, 16% that they had stopped smoking, and 34% that they were smokers. However, 96% considered smoking cessation as a good preventive measure for CVD.

In the subsequent section of the questionnaire, participants were asked to list the sources of information about diet and health. As shown in figure 3, the mass-media were considered the most important source of information, more relevant than doctors and health organizations.

Finally, a series of questions was administered to investigate in detail the knowledge of participants about dietary fats and food (Table III).

Table II. For each of the following actions people might decide to control high blood cholesterol levels; please state whether it would help or not.

	Would help (%)	Would not (%)	Don't know (%)
Getting regular exercise ...	82.4	10.1	7.5
Taking more vitamins ...	78.7	11.6	9.7
Reducing cholesterol intake ...	93.6	1.9	4.5
Reducing salt intake ...	85.4	11.2	3.4
Reducing fat intake in general ...	100	–	–
Reducing sugar intake ...	82.0	15.0	3.0
Eating less ...	84.6	13.9	1.5
Using skimmed milk or low-fat dairy products ...	92.1	5.6	2.2
Eating poultry instead of meat ...	94.0	3.4	2.6
Eating less cheese ...	84.6	10.9	4.5
Eating cereals or bread containing oat grains ...	79.0	14.2	6.7
Eating fewer eggs ...	81.6	11.2	7.1
Eating more fish ...	97.4	1.1	1.5
Eating less salted meats ...	97.0	2.6	0.4
Reducing animal fat intake ...	95.5	1.5	3.0

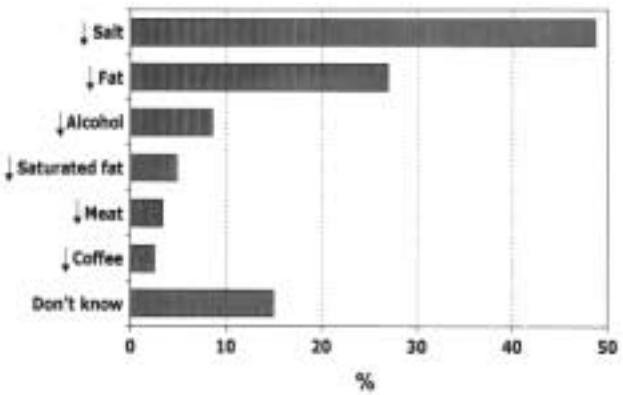

Figure 2. *What is the most relevant dietary factor affecting blood pressure? Lay people's reply.*

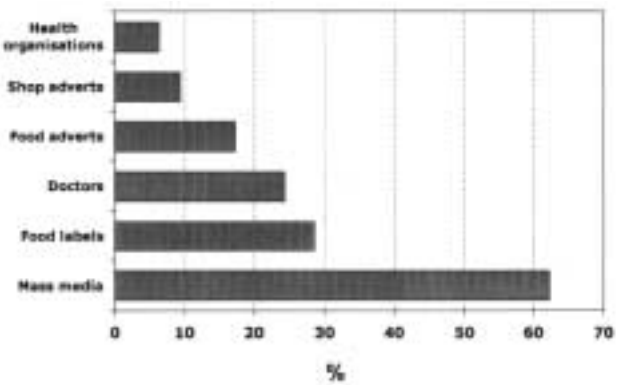

Figure 3. *What is the most important source of information on nutrition and health? Lay people's reply.*

Table III. Participants were asked to answer to the following questions about dietary fats.

	Yes (%)	No (%)	Not sure (%)
Have you heard about different kinds of fats, such as animal or vegetable fats?	74	19	7
Which kind of fat is more likely to be liquid rather than solid?			
Animal fats	9		
Vegetable fats	38		
Equally likely to be liquids	5		
Not sure/don't know	48		
Which kind of fat has the highest calorie content?			
Animal fats	56		
Vegetable fats	6		
Both the same	10		
Not sure/don't know	28		
Which kind of fat is more likely to raise blood cholesterol levels?			
Animal fats	70		
Vegetable fats	2		
Both of them	14		
Not sure/don't know	14		
Which kind of fat is mostly contained in animal fats?			
Saturated fats	23		
Polyunsaturated fats	3		
Not sure/don't know	74		
Is cholesterol mostly found in?			
Vegetables and vegetable oil	1		
Animal products such as meat and dairy products	52		
All foods containing fat or oil	31		
Not sure/don't know	16		

Most people perceived that the consumption of animal fats was associated with a higher risk of CVD; however, when questioned about saturated or unsaturated fats, most participants were hesitant, thus suggesting that the participants' knowledge was indeed superficial. In fact, when specifically asked to indicate any food rich in animal fat and in vegetable fat, respectively 39 and 51% of the participants were unable to answer the question.

Discussion

The present study aimed at evaluating the level of knowledge and attitudes of lay people and physicians with regard to the role of nutrition in the prevention of CVD. Considering the paucity of such studies in Italy, the information collected, although not representative of the whole Italian population, is significant. The response rate achieved in the present study (physicians 63%, lay people 59%) was comparable to that of previous studies[9-11]. An added value of the present investigation is the simultaneous assessment of the level of knowledge and attitudes on nutrition and CVD of a sample of population and their own physicians.

Apparently, the level of knowledge within the population appears to be satisfactory. Caution indeed must be exercised in the interpretation of the findings and, particularly, when attempting to determine the actual behavior from the answers given by participants. In such studies, participants are in fact inclined to give a positive impression, thus leading to an overestimation of positive findings. To overcome this bias, at least in part, the questionnaires contained some questions repeated in a different way. This allowed for cross-checking of the answers. In general, the persons interviewed showed a good awareness of the role of cholesterol as a risk factor for CVD; however, some inconsistencies should be noted.

Although most of the participants had their blood cholesterol level regularly checked, it may be of concern that a large majority of them did not know their blood cholesterol level and which is the "desirable" value of this parameter.

Overall, participants were aware of the existence of different kinds of dietary fats and almost correctly identified animal fats as relevant dietary factors affecting serum cholesterol levels and possibly atherogenesis. However, only a minority was able to indicate three or more food items rich in saturated fats, while a consistent percentage was unable to indicate any. Similarly, in spite of the relevance of olive oil in the Italian diet, it was surprising, and somehow a reason for concern, that only half of the sample was able to indicate any dietary source of vegetable fat, and only 1 out of 5 identified olive oil as a vegetable fat. This evidence strongly indicates that, on the whole, consumers are unable to interpret the information on food labels: in view of this, physicians prescribing dietary modifications, should take into account the possibility that their patients be unable to accurately follow their prescriptions or that they may even misunderstand them. As a consequence, dietary counseling cannot be limited to a simple list of allowable foods but time must be spent to provide the basic rudiments of knowledge in this area with the aim of improving the patients' awareness and thus their critical ability in adopting adequate eating behaviors. Finally, lay people recognized the mass-media as the most helpful and effective source of information about dietary prevention of disease and, in general, about nutrition. Although acknowledging the educational role of the media, this finding stresses the need of a greater involvement of family doctors and health authorities in educational programs focusing on the relationship between nutrition and health.

Physicians felt prepared to provide adequate dietary counseling to their patients in order to reduce CVD risk. The cholesterol level indicated as desirable by

most physicians was comparable to that reported by US[9,10] or Finnish[11] doctors, although a cholesterol-lowering diet was often started at higher serum cholesterol levels. Most physicians stressed the importance of diet as often as possible, even after having prescribed drug therapy to hypercholesterolemic patients. However, they appeared resigned to accept that the majority of their patients going on medication took on a more relaxed attitude towards dieting or even gave it up completely. A possible explanation, at least partly confirmed by the analysis of the answers of the lay people, may be that physicians reduce their interest or emphasis with regard to the diet once drug therapy starts. As inferred from the questionnaires for lay people, physicians mainly focus their efforts on secondary prevention and leave less room for primary prevention strategies.

Some other aspects of the attitude of family physicians towards dietary prevention of CVD deserve further comments. For instance, an unexpectedly high number of physicians shared the lay people's opinion that cholesterol-lowering diets may be associated with an increased risk of cancer. This contention is based on the inappropriate interpretation of the results of some studies[17,18] which suggest an association between cancer and serum cholesterol-lowering diets. On the other hand, in the light of further discussion on the available data, there is a wide consensus on the safety of both dietary and pharmacological cholesterol-lowering strategies[19]. This point again raises the problem of information flow and the need for continuous medical education programs.

Some physicians considered the preoccupation of lay people in CVD risk factors somewhat exaggerated. In particular, physicians showed some perplexity about the inappropriate anxiety that mass-media generate among people. This datum mirrored what emerges from the analysis of lay people questionnaires, suggesting a prominent role of mass-media, either press or television, in providing health-related information and, sometimes, also nutritional education with possible adverse effects[20,21].

Regular physical activity was recognized by both physicians and lay people as a protective measure against CVD; it was therefore surprising to observe the extremely low percentage of people who regularly perform exercise. This finding would partly suggest that physicians do not sufficiently motivate their patients in exercising regularly (a weak propensity has also been shown among US doctors[22]) but also – and probably more importantly – reflects the poor attitude towards physical activity in Italy. Although the population of the present study was only representative of a well-defined geographical area in Southern Italy, provisional indications on the knowledge and attitude of lay people and family physicians to the dietary management of CVD risk factors can be drawn. A good propensity was apparent among both lay people and physicians towards the adoption of dietary measures to prevent CVD. However, the attitude towards daily implementation of preventive measures appears to be inadequate. In particular, additional strategies must be developed to help doctors to ensure a high standard of information and of specific knowledge and to encourage the interaction with their patients in order to effectively counteract cardiovascular diseases. Regular educational programs for health professionals should be encouraged and more attention should be paid to the education of the public, also taking into account the results obtained in other countries where the continuous implementation of educational initiatives has resulted in a progressive amelioration in the knowledge and attitude of health professionals and of lay people towards CVD risk factors. This strategy has had a strong impact on public health. For example, the reduction in the average serum cholesterol levels and consequently in the CVD death rates observed in Finland and in the United States after the implementation of massive educational programs constitutes a case in point.

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