

Prevention and health promotion in clinical practice: the views of general practitioners in Europe

Carlos Brotons*, Celia Björkelund, Mateja Bulc, Ramon Ciurana, Maciek Godycki-Cwirko,
Eva Jurgova, Pilar Kloppe, Christos Lionis, Artur Mierzecki, Rosa Piñeiro,
Liivia Pullerits, Mario R. Sammut, Mary Sheehan,
Revaz Tataradze, Eleftherios A. Thireos, Jasna Vuchak
on behalf of the EUROPREV network¹

Sardenya Primary Care Center, 08025 Barcelona, Spain²

Available online 6 October 2004

Abstract

Background. Disease prevention and health promotion are important tasks in the daily practice of all general practitioners (GPs). The objective of this study was to explore the knowledge and attitudes of European GPs in implementing evidence-based health promotion and disease prevention recommendations in primary care, to describe GPs' perceived barriers to implementing these recommendations and to assess how GPs' own health behaviors affect their work with their patients.

Methods. A postal multinational survey was carried out from June to December 2000 in a random sample of GPs listed from national colleges of each country.

Results. Eleven European countries participated in the study, giving a total of 2082 GPs. Although GPs believe they should advise preventive and health promotion activities, in practice, they are less likely to do so. About 56.02% of the GPs answered that carrying-out prevention and health promotion activities are difficult. The two most important barriers reported were heavy workload/lack of time and no reimbursement. Associations between personal health behaviour and attitudes to health promotion or activities in prevention were found. GPs who smoked felt less effective in helping patients to reduce tobacco consumption than non-smoking GPs (39.34% versus 48.18%, $P < 0.01$). GPs who exercised felt that they were more effective in helping patients to practice regular physical exercise than sedentary GPs (59.14% versus 49.70%, $P < 0.01$).

Conclusions. Significant gaps between GP's knowledge and practices persist in the use of evidence-based recommendations for health promotion and disease prevention in primary care.

© 2004 The Institute For Cancer Prevention and Elsevier Inc. All rights reserved.

Keywords: Attitudes; Prevention; Health promotion; Clinical practice; General practice

Introduction

Disease prevention and health promotion are important tasks in the daily practice of all general practitioners (GPs). A recent suggested definition of general practice emphasizes the role of GPs in prevention, stating that 'the general practitioner engages with autonomous individuals across the fields of prevention, diagnosis, cure, care and palliation, using and integrating the sciences of biomedicine, medical psychology and medical sociology' [1].

* Corresponding author. Sardenya Primary Care Center, C/Sardenya 466, 08025 Barcelona Spain.

E-mail address: cbrotons@eapsardenya.net (C. Brotons).

¹ EUROPREV (The European Network for Prevention and Health Promotion in General Practice/Family Medicine - www.europrev.org) is a network organisation within WONCA Region Europe – The European Society of General Practice/Family Medicine.

² Coordinating and Data Management Centre: Carlos Brotons (Coordinator), Ramon Ciurana, Pilar Kloppe, Rosa Piñeiro, Juan José Antón, Manuel Iglesias, Marco Fornasini.

Two thirds of the population visit their GP one or more times each year and 90% at least once in 5 years [2]. Therefore, GPs are in an excellent position to administer age- and sex-specific preventive and health promotion packages in an opportunistic manner, that is, when patients visit them for any reason. However, differences in the structure and organisation of practice in European countries are associated with a large variation in the degree of involvement of general practitioners in preventive activities [3]. The Canadian Task Force on the Periodic Health Examination [4] and the US Preventive Services Task Force [5], which are probably the most comprehensive preventive guidelines that have been published, recommend a very limited screening physical examination, relatively few screening laboratory tests and extensive risk-specific counselling. Nevertheless, studies carried out in the US have shown that family physicians perform extensive screening physical examination and many screening laboratory test of unknown effectiveness [6]. Moreover, a recent study has shown that less than half of all Americans receive some of the most valuable and effective preventive health services available to them [7]. Other countries have developed and evaluated their own guidelines, showing that there is an unequal level of performance depending on the preventive procedure and on the target population [8].

Previous research about the role of primary care physicians in prevention and health promotion has been concentrated on specific topics such as attitudes to and involvement in health promotion and lifestyle counselling [9], and perception of GPs in modifying behaviour [10].

The objective of this study was to explore the knowledge and attitudes of European GPs in implementing evidence-based, health promotion and disease prevention recommendations in primary care, to describe GPs' perceived barriers to implementing these recommendations, and to assess how GPs' own health behaviors affect their work with their patients.

Methods

Design

A postal survey was carried out using a pre-paid addressed envelope. We developed and pre-tested a questionnaire that included the following parts: the first with demographic and professional data (10 questions), the second one with two clinical scenarios comprising a list of different preventive and health promotion activities with two different columns for responses—beliefs and attitudes in practice (34 questions), a third part with items related with barriers in implementing preventive activities (6 questions) and the last part which included items concerning personal health behaviour (21 for GP males and 25 for GP females).

The questionnaire was translated and adapted from English into the different languages (except for Malta where English is an official language), being piloted with ten GPs in each country. A random sample of GPs from databases which listed GPs from national colleges of each country was selected.

Preliminary results of this survey, specifically those related to advising overweight and sedentary patients, have already been published as part of another project [11].

Sample size calculation

With an estimated true proportion of 0.5 (the most conservative estimation), the maximum acceptable difference of 0.05, and an alpha error of 0.05, the required sample size was calculated per country according to the number of GPs affiliated to each college, except for the case of Greece where GPs were randomly selected from a list of all GPs registered in the Greek national journal.

Assuming a minimum rate of participation of 50%, sample size was increased to compensate for anticipated loss. This was done by multiplying the sample size by the quantity $1/(1 - d)$, where d is the anticipated loss.

In some countries, as in the case of Malta, the questionnaire was sent to all the physicians, due to the small number of GPs listed. The survey instrument and an addressed stamped return envelope were mailed to all physicians from June to December 2000. Those who did not respond received follow-up mailings and/or telephone calls.

Statistical analysis

All the collected questionnaires were sent back to the coordinating and data management centre, assuring a centralised data entry and analysis. Mean and standard deviation for continuous variables and percentages for categorical variables were computed. Bivariate comparisons for categorical variables were performed using chi-square at the 0.05 level of significance. All analysis was performed using STATA programme (version 5.0).

Results

Eleven European countries participated in the study (Croatia, Estonia, Georgia, Greece, Ireland, Malta, Poland, Slovakia, Slovenia, Spain and Sweden), giving a total of 2082 GPs. The mean age was 44 years (SD 9.5, 23–84), and 60% were female. Table 1 shows sample size, age and sex characteristics of respondents by each individual country. The mean response rate was 54%, ranging from 50% in Malta to 65% in Croatia.

Professional characteristics requested in the first part of the questionnaire are shown in Table 2.

Table 1
Age and sex characteristics of respondents by individual countries

	N	Mean age	SD	% of females
Croatia	201	42.65	7.57	80.60
Estonia	156	42.60	7.90	94.87
Georgia	217	44.80	9.29	91.71
Greece	32	43.47	7.58	28.13
Ireland	220	46.37	10.05	35.91
Malta	156	44.71	12.53	25.64
Poland	314	41.82	7.42	69.43
Slovakia	165	46.44	9.81	47.88
Slovenia	55	46.59	6.43	56.36
Spain	270	35.62	6.28	58.15
Sweden	296	51.43	7.04	43.46

N = sample size.

SD = standard deviation.

The second part of the questionnaire had two clinical scenarios, the first involving a 52-year-old male and the second a 57-year-old female, both of whom are visiting the GP for the first time with a trivial problem. They have no previous 'check-ups' or tests, no personal or family history of any major condition and they do not have known risk factors. GPs were asked to mark a list of preventive and health promotion activities that they believe should be done in each scenario and, at the same time and in a different column, if they actually do them in clinical practice. Responses to the first scenario are shown in Table 3 with those to the second scenario in Table 4.

The third part of the questionnaire included questions about GPs' perception of carrying out prevention and health promotion activities and of barriers in implementation. Table 5 shows the results regarding perception in carrying out certain prevention and health promotion activities by individual country. Table 6 shows the barriers perceived by GPs to implementing health promotion and preventive activities by individual countries. The results regarding personal health habits assessed in the fourth part of the questionnaire are shown in Table 7 and specific results on

Table 2
Professional characteristics of GP participants (N = 2082)

Work in		
Urban area	1112	53.41%
Rural area	419	20.12%
Both	512	24.59%
Other	39	1.87%
Main clinical practice done in		
Primary health centre	960	53.77%
Solo practice	501	24.06%
Hospital	50	2.40%
Other	495	23.77%
You work in a		
Public centre	1189	57.11%
Private centre	572	27.47%
Other	321	15.42%
Postgraduate teaching activities		
Yes	997	47.89%
No	1085	52.11%

Table 3
Responses to the first clinical scenario

	Should it be done? (yes as %)	Do I do it? (yes as %)
Measure cholesterol level	63.06	58.84
Measure blood pressure	91.07	83.53
Measure glucose level	65.90	60.18
Screening for colon cancer ^a	25.12	18.97
Screening for prostate cancer ^b	48.66	41.93
Screening for lung cancer ^c	45.73	40.78
Tetanus immunisation	40.68	34.44
Advise smokers to quit	96.69	71.33
Advise heavy drinkers to reduce consumption	87.42	63.78
Estimate BMI	63.64	41.59
Advise overweight patients	85.78	62.44
Advise sedentary patients	83.86	57.25

BMI: body mass index.

^a Either with faecal occult blood test or with sigmoidoscopy.

^b Either with prostatic specific antigen or digital rectal examination.

^c With chest X-rays.

tobacco and exercise by individual country are shown in Table 8. Important variations among countries are observed particularly in tobacco smokers, ranging from 3.72% in Sweden to 48.48% in Slovakia.

Bivariate analysis

GPs who had their blood cholesterol measured at least once in the last 5 years measured their patients' blood cholesterol more often, according to the results of the first clinical scenario (64.54 vs. 42.07, $P < 0.01$) or the second clinical scenario (61.64 vs. 42.95, $P < 0.01$). Also, GPs who had their blood pressure measured at least once in the last 5 years measured the blood pressure of their patients more often according to the results of the first clinical scenario (85.31 vs. 68.18, $P < 0.01$) or the second clinical scenario (78.43 vs. 57.95, $P < 0.01$).

Table 4
Responses to the second clinical scenario

	Should it be done? (yes as %)	Do I do it? (yes as %)
Measure cholesterol level	64.70	56.87
Measure blood pressure	84.53	76.46
Measure glucose level	77.67	67.72
Screening for colon cancer ^a	25.38	15.99
Screening for breast cancer ^b	78.19	68.25
Screening for cervical cancer with Pap smear	64.55	49.47
Tetanus immunisation	44.00	35.54
Advise smokers to quit	86.26	61.05
Advise heavy drinkers to reduce consumption	82.08	56.77
Estimate BMI	64.70	42.75
Advise overweight patients	84.58	59.46
Advise sedentary patients	80.45	54.37

BMI: body mass index.

^a Either with faecal occult blood test or with sigmoidoscopy.

^b Either with mammography or clinical examination.

Table 5

Perception of general practitioners regarding the carrying out of prevention and health promotion activities by individual countries (Yes as %)

	Croatia	Estonia	Georgia	Greece	Ireland	Malta	Poland	Slovakia	Slovenia	Spain	Sweden	ALL
Carrying-out prevention and health promotion activities is difficult	29.95	60.39	73.96	61.29	60.75	49.04	61.99	53.37	61.82	52.44	55.43	56.02
Minimally effective or ineffective in helping patients reduce tobacco use	63.82	76.92	66.67	41.38	48.38	49.36	50.33	55.49	41.82	56.00	30.07	53.14
Minimally effective or ineffective in helping patients reduce alcohol consumption	74.78	81.29	67.29	41.93	58.99	43.59	66.77	60.37	56.37	71.74	53.79	63.84
Minimally effective or ineffective in helping patients achieve or maintain normal weight	73.50	64.11	61.40	22.58	57.14	35.26	40.39	56.51	54.55	75.28	64.73	58.25
Minimally effective or ineffective in helping patients practice regular physical exercise	77.00	55.84	51.63	25.00	48.14	27.10	46.38	62.42	25.92	58.87	56.73	52.82

GPs who smoked felt less effective in helping patients to reduce tobacco consumption than non-smoking GPs (39.34% versus 48.18%, $P < 0.01$). GP smokers advised quitting to patients who smoked less often than non-smoking GPs (for both clinical scenarios) but results are not statistically significant.

Sedentary GPs advised sedentary patients to perform regular physical exercise less often than GPs who exercised regularly, both in the first clinical scenario (54.64 vs. 59.82, $P = 0.045$) and in the second clinical scenario (53.61 vs. 56.00, $P = 0.034$). Also, GPs who exercised felt that they were more effective in helping patients to practice regular physical exercise than sedentary GPs (59.14% versus 49.70%, $P < 0.01$). No differences were found between obese ($BMI > 30 \text{ kg/m}^2$) and non-obese GPs in advising overweight patients to reduce weight and in the perception of effectiveness in helping patients to achieve or maintain normal weight.

GPs immunised against tetanus advised vaccination more often than non-immunised GPs, both in the first clinical scenario (37.39 vs. 22.88, $P < 0.01$) and in the second clinical scenario (38.42 vs. 24.29%, $P < 0.01$). No differences were found as regards the carrying out of mammography between female GPs having undergone mammography and those who have not. On the other hand, female GPs having undergone cervical cytology carried out cytological tests on their patients more often than women GPs who have not undergone cervical cytology (54.81% vs. 45.50%, $P = 0.016$).

Discussion

European networks such as EUROPREV have the facility to obtain and share useful information from national colleges of GPs in order to compare not only organisational health

Table 6

Barriers perceived by GPs to implementing health promotion and preventive activities (non-exclusive answers) by individual countries (Yes as %)

	Croatia	Estonia	Georgia	Greece	Ireland	Malta	Poland	Slovakia	Slovenia	Spain	Sweden	ALL
Heavy work load and lack of time	73.50	68.39	4.63	67.74	84.72	55.77	72.22	37.80	92.73	94.05	87.77	67.69
No reimbursement	64.00	48.39	65.74	12.90	55.56	22.58	52.94	31.29	34.55	7.43	21.86	39.95
Patients' accessibility	50.50	17.31	65.28	64.52	28.24	39.10	36.72	8.54	20.00	17.10	14.34	30.97
Lack of consensus (discrepancies in the recommendations)	19.50	29.49	9.26	19.35	31.48	20.51	29.97	45.12	20.00	32.09	25.81	26.66
Patients' doubts about effectiveness	16.50	42.31	23.61	32.26	19.91	31.41	32.79	45.40	14.55	22.68	7.89	25.27
Lack of clarity on which professional in primary care is responsible	31.00	18.59	11.11	16.13	14.35	19.87	24.76	33.13	25.45	21.27	10.04	20.08
Insufficient personal training in prevention and health promotion	18.00	23.72	17.13	29.03	17.59	23.72	16.61	40.85	10.91	15.61	12.19	19.23

Table 7
Results regarding personal health habits

	Mean	SD
Weight	71.48	(13.22)
Height	169.85	(8.85)
BMI	24.64	(3.57)
Alcohol consumption per week ^a	5.73	(7.63) %
Cigarette smokers		14.79
Cigars/pipe smokers		3.94
Exercise regularly ^b		38.30
Immunised against influenza ^c		51.56
Immunised against hepatitis B		64.43
Immunised against tetanus		79.63
Immunised against rubella (fertile women)		45.97
BMI = > 25 kg/m ²		31.56
BMI = > 30 kg/m ²		7.13
High risk for colorectal cancer ^d		7.70
Screening for colon cancer (with faecal occult blood test and/or sigmoidoscopy)		11.69
Screening for prostate cancer (with digital rectal examination and/or PSA) ^e		25.84
High risk of breast cancer ^f		23.29
Screening for breast cancer (with mammography) ^c		36.57
High risk cervical cancer ^g		5.30
Screening for cervical cancer ^c		83.16

BMI: body mass index.

^a A drink was considered equal to the content of a glass of 100 ml of wine, 200 ml of beer or 25 ml of whisky.

^b Daily or two to three times a week.

^c Every year or only some years.

^d Those persons with one or more of the following are considered to be at increased risk: tubular adenomas of >1 cm, villous or tubulovillous adenomas of any size, hereditary gastrointestinal polyposis syndromes, personal or familial history (first degree) of colorectal cancer, endometrial cancer, ovarian cancer, ulcerative colitis of more than 8–10 years of evolution for extensive forms (pancolitis) or more than 15 years of evolution in ulcerative colitis of the left side of colon.

^e At least one screening test carried out.

^f Women with one or more of the following are considered to be at high risk: personal or familial (first degree) history of breast cancer (higher risk if it was bilateral affection or before menopause), precocious menarche (<12 years old), nulliparity, first pregnancy in advanced age (>30 years), late menopause (>55 years old), hormone replacement therapy, hormonal contraception, obesity, breast ionizing radiations, high alcohol consumption.

^g Women with one or more of the following are considered to be at high risk: tobacco use, low socioeconomic level, precocious beginning of sexual relationships, high number of sexual partners, infection by human papilloma virus.

services, but also to collate guides and tools used for prevention and health promotion in clinical practice. Our network of GP colleges also permits the running of specific research projects, such as the survey that we carried out of more than 2000 GPs. Although our study involved the participation of 11 colleges of GPs, the results do not represent all countries of Europe and therefore the authors would welcome information from additional national colleges that could contribute to the information of this survey.

As it is likely that respondents had a more favourable attitude to health promotion than primary health professionals in general, the results could have a bias in that they may be overestimated. It is difficult to compare our results with

the ones obtained in other surveys because different methods were used.

The replies to the two clinical scenarios show that, while GPs believe they should advise preventive and health promotion activities, in practice, they are less likely to do so. This fact is not so clear for activities that involve requesting investigations such as total cholesterol, blood pressure or glucose, perhaps reflecting that ordering tests is preferred to giving verbal advice.

López-de-Munain et al. [12] also evaluated preventive services in 635 GPs in routine general practice in Spain and found similar results for advisory activities but lower results for screening activities for cardiovascular risk factors. From those activities, measuring weight is the lowest, illustrating that some GPs may think that measuring weight, height and BMI is a waste of time, since overweight and obese patients may be the worst group of patients on whom to test the success of dietary advice.

Some preventive activities that are either ineffective (such as screening for lung cancer) or not evidence-based (such as screening for prostate cancer) were included on purpose in the questionnaire. Surprisingly, about 40% of GPs answered that they do perform these activities in practice. No organisations currently recommend routine screening for lung cancer (with either chest x-rays or sputum cytology) of either the general population or of smokers [4,5]. Concerning prostate cancer, there is no evidence to determine whether or not early detection and treatment improve survival. Routine screening for prostate cancer remains a controversial topic, with arguments against and in favour [13,14]. Advocates of screening argue that evidence and common sense warrant screening even in the absence of controlled trial data, while advocates of the scientific method hold that screening programs should be proven beneficial before being universally adopted.

Concerning the barriers in implementing prevention and health promotion, the two most important causes reported

Table 8
Results regarding personal habits (tobacco and exercise) by individual countries

	Smokers ^a	Exercise regularly ^b
Croatia	23.88	38.46
Estonia	7.69	35.48
Georgia	14.29	36.62
Greece	31.25	23.33
Ireland	10.91	62.21
Malta	12.82	36.78
Poland	15.29	35.14
Slovakia	48.48	45.86
Slovenia	9.09	60.00
Spain	19.62	52.26
Sweden	3.72	56.57

^a Cigarette and/or cigars/pipe smokers.

^b Daily or two to three times a week.

were heavy workload/lack of time and no reimbursement. In fact, these were also two of the most important barriers identified in a WHO survey of over 2300 GPs in 16 countries [15].

We observed that more than half of the GPs were skeptical of helping patients reduce tobacco use, decrease alcohol consumption, achieve or maintain normal weight, and practice regular physical exercise. Other surveys have shown similar results, with, for instance, one done in 200 GPs in the province of Quebec, Canada [16] having shown that 59%, 58% and 48% of GPs believed that they were ineffective in smoking cessation or reduction, in increasing physical activity or in improving food habits, respectively. In the UK, another study carried out in 230 GPs [9] reported even lower results regarding current feelings about helping patients change lifestyle behaviour. However, when the same doctors were asked about their potential feelings at helping patients after adequate training and support, 64%, 58%, 60% and 50% of GPs felt effective or very effective in changing patients behaviour concerning smoking, alcohol consumption, exercise and excess calories, respectively.

Interestingly, we found associations between personal health behaviour and attitudes to health promotion or activities in prevention, except for obese GPs in advising overweight patients. This fact was also observed in other studies in which attitudes to smoking cessation have been found to be less positive among doctors and nurses who smoke [17], and where the likelihood of counselling about physical activity was shown to be lower in unfit doctors than in physically fit ones [18]. However, this contrasts with another study of health professionals in which no association was found between personal health behaviour and activities in cardiovascular risk prevention [19]. The reason for this may be due to the fact that sample size was relatively small in the latter study.

A questionnaire-based study of a representative sample of US women physicians [20] demonstrated that being a primary care practitioner and having related healthy habits oneself were the most significant correlates with self-reported prevention-related counselling and screening practices. Another interesting study about physician disclosure of healthy personal behaviours [21] has shown that physicians' abilities to motivate patients to adopt healthy habits can be enhanced by conveying their own healthy habits. Certainly, these findings suggest potential new directions for physician training.

Surveys such as this are in large part based on self-reporting by GPs, and reflect what GPs think they do or should do. More objective evidence (e.g., chart audits) is needed to see what GPs actually do in practice; for this reason, it is crucial that GPs systematically record the most relevant preventive and health promotion activities that they perform. We conclude from this study that significant gaps between GPs' knowledge and practices persist in the use of evidence-based recommendations for health promotion and

disease prevention in primary care, and that possible strategies to tackle these discrepancies need to be devised.

Acknowledgments

The EUROPREV network: Mary Sheehan (Irish College of General Practitioners), Ton Drenthen (Dutch College of GPs), Godfrey Fowler (Royal College of General Practitioners), Revaz Tataradze (Georgia Association of GPs and FPs), Artur Mierzecki, Maciek Godycki-Cwirko (The College of Family Physicians in Poland), Mario R Sammut, (Malta College of Family Doctors), Eva Jurgova (Slovak Society of General Practice), Elena V. Frolova (St. Petersburg Medical Academy of Postgraduate Study), Liivia Pullerits (Estonian Family Doctors Association), Carlos Martins (Portuguese Association of GPs), Mateja Bulc (Slovenian Medical Association), Sirkka Keinanen-Kiukkanniemi (Finish College of GPs), Jasna Vucak (Croatian Association of Family Physicians), Cecilia Björkelund, (Swedish College of GPs), Hava Tabenkin, Eleizzer Kitai (Israel Association of Family Physicians), Ruta Radzeviciene (Lithuanian Association of GPs/Family Physicians), Frede Olesen (Danish College of GPs), Mehmet Ugan, Süleyman Görpeliođlu Suleyman Gorpelioglu (Turkey Family Physicians Association), Christos Lionis, Eleftherios A. Tiroos (Greek Association of GPs), Frans Govaerts, Leo Pas, André Franck (Scientific Society of Flemish GPs), Maxime Mancini, Dominique Durrer (Swiss Association of GPs), Donatella Sghedoni (Center for Study and Research in General Practice-Italy), Ingrid Pichler (Austrian Society of GPs and Family Medicine), Rados Assenova (Department of General Practice Higher Medical Institute), Valia Markou (General Practitioners of Cyprus), Carlos Brotons, Ramon Ciurana, Pilar Kloppe, Rosa Piñeiro, Antonia Sanchez (Spanish Society of Family and Community Medicine).

We thank all the general practitioners for their time spent in answering the questionnaire and all the European national colleges who supported the study. We also thank the support of the Spanish Program of Prevention and Health Promotion, and the support of Public Health Division of the Catalan Department of Health.

References

- [1] Olesen F, Dickinson J, Hjortdahl P. General practice—Time for a new definition. *Br Med J* 2000;320:354–7.
- [2] Fraser RC. Setting the scene. In: Fraser RC, editor. *Clinical method. A general practice approach*. second ed. Oxford: Butterworth Heinmann; 1992.
- [3] Buerma WG, Van der Zee J, Fleming DM. Service profiles of general practitioners in Europe. *Br J Gen Pract* 1997;47:481–6.
- [4] Canadian Task Force on the Periodic Health Examination. *Clinical preventive health care*. Ottawa, Ontario: Canada Communications Group; 1994.
- [5] US Preventive Task Force. *US preventive services task force. Guide to*

- clinical preventive services. second ed. Baltimore, MD: Williams and Wilkins; 1996.
- [6] Luckmann R, Melville SK. Periodic health evaluation of adults: a survey of family physicians. *J Fam Pract* 1995;40:547–54.
- [7] Coffield AB, Maciosek MV, McGinnis JM, et al. Priorities among recommended clinical preventive services. *Am J Prev Med* 2001;21:1–9.
- [8] Brotons C, Iglesias M, Martín Zurro A, Martín Rabadán M, Gene J. Evaluation of preventive and health promotion activities in 166 primary care practices in Spain. *Fam Pract* 1996;13:144–51.
- [9] McAvoy B, Kaner EFS, Lock LA, Heather N, Gilvarry E. Our healthier nation: are general practitioners willing and able to deliver? A survey of attitudes to and involvement in health promotion and lifestyle counselling. *Br J Gen Pract* 1999;49:187–90.
- [10] Wechsler H, Levine S, Idelson RJ, Schor EL, Coakley E. The physician's role in health promotion revisited—A survey of primary care practitioners. *N Engl J Med* 1996;334:996–8.
- [11] Brotons C, Ciurana R, Piñeiro R, Kloppe P, Godycki-Cwirko M, Sammut MR. Dietary advice in clinical practice: the views of general practitioners in Europe. *Am J Clin Nutr* 2003;77:1048–51.
- [12] Lopez-de-Munain J, Torcal J, Lopez V, Garay J. Prevention in routine general practice: activity patterns and potential promoting factors. *Prev Med* 2001;32:13–22.
- [13] Oottamasathien S, Crawford DE. Should routine screening for prostate-specific antigen be recommended? *Arch Intern Med* 2003;163:661–3.
- [14] Hoffman RM. An argument against routine prostate cancer screening. *Arch Intern Med* 2003;163:663–5.
- [15] McAvoy BR. A scandal of inaction: how to help GPs implement evidence-based health promotion. *Br J Gen Pract* 2000;50:180–181.
- [16] Grant AM, Niyonsenga T, Dion I, Delisle E, Xhignesse M, Bernier R. Cardiovascular disease. Physicians attitudes toward prevention and treatment. *Can Fam Physician* 1998;44:780–7.
- [17] Reeve K, Adams J, Kouzekanani K. The nurse as exemplar: smoking status as a predictor of attitude toward smoking and smoking cessation. *Cancer Pract* 1996;4:31–3.
- [18] Sherman SE, Hershman WY. Exercise counselling: how do general internists do? *J Gen Intern Med* 1993;8:243–8.
- [19] Steptoe A, Doherty S, Kendrick T, Rink E, Hilton S. Attitudes to cardiovascular health promotion among GPs and practice nurses. *Fam Pract* 1999;16:158–63.
- [20] Frank E, Rothenberg R, Lewis C, Belodoff BF. Correlates of physicians' prevention-related practices. Findings from the women physicians' health study. *Arch Fam Med* 2000;9:359–67.
- [21] Frank E, Breyan J, Elon L. Physician disclosure of healthy personal behaviors improves credibility and ability to motivate. *Arch Fam Med* 2000;9:287–90.