Risk factors in women's health in different stages of life

Hedwig M.M. Vos

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Treat people as if they were what they should be, and you help them become what they are capable of becoming. Johann Wolfgang von Goethe

> Voor Werner Voor mijn ouders

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General introduction

General introduction

As a general practitioner in The Hague in the Netherlands prevention has always been important to me. I work together with my colleague (also a female GP) and relatively many female patients are listed in our practice. But during busy office hours prevention is not always the first thing on my mind. Let alone making a selection of our listed patients to invite them for measurements within the context of prevention...

To illustrate how I dealt with prevention before I started to write this thesis I want to describe three situations, with three different patients, who consulted me as their GP in 2005.

Mrs A. is a 21 year old female. She has an allergic asthma and we recently invited her for a spirometry in our practice. She now has an appointment with me to discuss the results. It appears that she has symptoms of dyspnea when she exercises and when she has a cold. Her spirometry results point out that her asthma is not optimally controlled. Moreover, she smokes. I explain that smoking will aggravate her symptoms and that if she would quit smoking she would have less difficulty breathing. I invite her to talk about smoking cessation another time and explain what I can do to support her. I also prescribe her another type of medication for her asthma and invite her to come back in two weeks. She leaves my consultation room with a leaflet about smoking cessation and seems rather motivated to quit smoking.

Mrs B. is 49 years old. She has made an appointment for a cervical Pap smear. She received our invitation for screening earlier this year, in the year she will become 50 years old. She postponed the appointment for a while, but wants to have it done before her 50th birthday. She tells me that she has no gynaecological complaints and her last period was about six months ago. Her cycle has been irregular for more than two years. While performing the Pap smear I notice that it is painful. I tell her that I see that it is painful for her and ask her if intercourse is painful as well. She confirms that it is sometimes painful but that she uses a lubricant. That works well for her and her partner. I tell her she can call the practice in a couple of weeks for the results of the Pap smear and when everything is normal she will receive another invitation in five years. I also tell her that if her sexual problems get worse she is welcome to make an appointment with me.

Mrs C. is 84 years old. She has diabetes mellitus type 2, coxarthrosis, chronic pain in her shoulders and severe headaches. Every once in a couple of years she perceives symptoms of a minor depression, usually during the fall. She uses insulin and metformin, a statin, an ACE-inhibitor and a diuretic. Furthermore she uses pain medication. She is unable to visit the practice because of her pain and her difficulty to walk. In her case the diabetes control visits are performed by myself instead of by my practice nurse, for in more than one occasion she also has other questions for me as her GP. At least every three months I go to see her. Because of her chronic pains she leads a mostly

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sedentary life, despite weekly physical therapy, fortunately still covered by her health insurance. Because of the chronic pain, and as a consequence her chronic stress, combined with her obesity, it is quite a challenge to optimize her blood glucose levels and blood pressure. She is never demanding, understands that her conditions are chronical and she would rather do with one pill less than having a new type of medication prescribed. Which makes my diabetes checks not much more than watchfull waiting for what happens.

Prevention

Prevention when possible is better than cure when necessary. Or as the American politician and scientist Benjamin Franklin stated: "An ounce of prevention is worth a pound of cure". A direct strategy for confronting both spending and disease burden is to mitigate the problem at its source by preventing the early onset of disease. Health promotion and disease prevention - eg, behavior modification, immunizations, and early detection (screening) - can modulate the prevalence and severity of disease.¹

Prevention programs can be designed to reach an entire (sub) population or individuals and can be divided into four classes: universal, selective, indicated and health care related prevention. Universal prevention strategies are designed to reach the entire population, which has not been identified on the basis of individual risks. Selective prevention strategies target subgroups of the general population that are determined to be at (high) risk. Indicated prevention interventions identify individuals who are not known with a certain disease but have risk factors or experience early signs. Health care related prevention targets individuals with a disease or multiple health problems.²

From a preventive point of view general practitioners (GPs) are important health care professionals because they can reach many people for selective, indicative and health care related prevention. About three quarters of all people consult their GP at least once a year.³ Access to Dutch GP-care is considered very good. GPs are ideally placed for prevention and health promotion in the form of enquiring people about their lifestyles and for providing information and counseling concerning risk factors.⁴ If preventive advice is related to the patient's current state of health, compliance may be stimulated.⁵ Moreover, most people do not object to the organization of preventive care through case finding and risk monitoring in primary care.⁶ GPs are already accustomed to health care related prevention by means of structured disease management programs for patients with diabetes mellitus type 2, cardiovascular diseases and chronic obstructive pulmonary disease (COPD).

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This is all well and good in theory, but reality turns out to be obstinate. Although it is obvious that prevention and health promotion are part of Dutch health care, clear agreements on who is responsible for the implementation and the attainment of prevention are not in place. There is a law on public health, that delegates the responsibility of universal prevention programs like the control of infectious diseases, disaster control and preventive youth health care to the local municipalities. Selective prevention has increasingly been placed in primary health care: the Dutch GP has been playing an ever-enlarging role in the systematic influenza vaccination and cervical cancer screening in the Netherlands. Other examples of selective and indicated prevention in Dutch screening programs, but not (entirely) accomplished by GPs, are mammographic screening for breast cancer, colorectal cancer screening, second trimester prenatal ultrasound, newborn screening for several treatable conditions and screening for familial hypercholesterolemia.

Despite evidence of the effectiveness of preventive services, actual rates of delivery of prevention activities by Dutch GPs, other than systematic influenza vaccination and cervical cancer screening, remain low. This pattern is also present in the UK concerning cancer screening by GPs.⁷ We notice that many GPs still hesitate to incorporate selective and indicated prevention programs, such as the module cardio-metabolic risk of the guideline Prevention Consultation, into their daily practice.⁸ Previous studies show that time constraints limit the ability of physicians to comply with preventive services recommendations.^{7,9,10}

Patient gender

Gender is a strong determinant of social outcomes, including health. Gender differences appear in lifestyle, the prevalence of risk factors, health problems, mortality, and access to medical care. Gender cannot be separated from other social identifiers such as ethnic background, age, or socio-economic status. Health problems in men and women vary according to socio-economic status, meaning that gender is strongly intertwined as determinant with socio-economic status, ethnic background, and age.¹¹ A gender sensitive approach to prevention in general practice begins with the acknowledgement and recognition of differences between women and men. It helps to identify the ways in which health risks, experiences and outcomes differ between women and girls, and men and boys, and to act accordingly.¹²

Gender plays a role in health care seeking and utilization. Patterns of reasons for consultation in primary care differ between men and women. Health status and physical symptoms are of greater importance in consultations by men, and factors related to screening and health

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education, obstetrical diagnoses and disorders of the genitourinary system are of greater significance among women.^{13,14}

Several studies show that among visitors of general practice female patients outnumber male patients.^{15,16,17,18} This higher use of health care by women raised the question in what way women can be a target population for prevention in general practice, since they actually use primary health care services on such a regular basis. Men, on the contrary, are less likely to utilize health care and preventive health services than women. These high risk behaviors and low utilization of health services may contribute to a lower life expectancy in men, thus creating a double setback for men.¹³

GP gender

Many studies have shown that male and female physicians differ in communication styles. The communication style of female physicians is more patient-oriented than that of male physicians. Male and female physicians differ in their use of additional tests; notably, intimate examinations, such as prostatic or vaginal examinations, are performed less frequently for patients of the opposite sex.¹⁹ Female GPs order more laboratory tests and perform fewer technical- medical interventions.²⁰ Male physicians prescribe medication more frequently;²⁰ for instance sedatives are prescribed more often by male physicians to female patients.¹⁹ The patients of female physicians receive more scheduled follow-up visits and referrals to other physicians than the patients of male physicians.²¹

Physician gender also can play a role in the quality of care provided by these physicians. In a cross-sectional study in 51,053 patients in Germany female physicians provide an overall better quality of care in patients with diabetes type 2, especially in prognostically important risk management.²² Female physician gender influences the provision of both screening and counseling services according to data derived from the 1998 Commonwealth Fund Survey of Women's Health, a nationally representative sample of U.S. adults, suggesting that preventive care benefits of having a female physician are present for both women and men.²³ In a study using nationally representative samples of the U. S. National Ambulatory Medical Care Surveys of encounters of 41,292 adult patients with 1470 primary care physicians, female physicians were more likely to see female patients, had longer visit durations, and the patients of female physicians were more likely to receive preventive services, such as breast and pelvic examinations, pap smears, mammograms, rectal examinations, and blood pressure measurements.²¹ Although counseling is more likely to occur for all patients when the regular physician is female, female patients are additionally more likely to receive preventive screening services.^{21,23} In a review of studies about women seeking gynecological- or obstetrical care and physician's gender in relation to patient preferences,

differences in communication style and patient satisfaction, those women who did express a gender preference, preferred a female gynecologist–obstetrician. These differences in gender preference are related to differences in communication style.²⁴ A meta-analysis showed that female GPs tend to have longer consultations with substantially more talk, especially with their female patients. Compared to male physicians, female physicians engaged in more positive talk, partnership-building, question-asking, and information-giving.²⁵

Women and prevention

From a preventive point of view gender plays a role in lifestyle related risk factors, like smoking. In developed countries as a whole the epidemic of smoking-attributed mortality among women continues to increase, offsetting the reduction in smoking-attributed mortality among men. Although the proportion of all deaths at ages 35-69 that are attributed to smoking is still generally greater in men than in women, the male and female proportions are converging and will probably cross over in some high resource countries.²⁶

Lifestyle is established early in life, setting the pattern for later years both in men and women.²⁷ Unhealthy behaviour starts in childhood or adolescence and often progresses in later life. Young women are increasingly at risk of future health problems because of their current unhealthy behaviour. A survey carried out of university students from 13 European countries demonstrates that the number of young women smoking has been increasing for years, and the number of young women exercising and eating healthy is decreasing.²⁷ Therefore their risk of future health problems such as diabetes mellitus type 2, cardiovascular disease, osteoporosis, infertility and copd is increasing. Diagnosing and counseling lifestyle in this age group could have an enormous impact on preventing lifestyle related diseases later in life. But also earlier in life the impact of prevention can be large, as the outcome of pregnancy can be influenced by several risk factors. During the Dutch 'Parents to Be' study GPs offered a systematic preconception consultation: 481 couples filled in a questionnaire and 98% of all couples reports one or more risk factors for which at least personal counseling by a GP is indicated.²⁸ Therefore it is important to study the opportunities a GP has to intervene with lifestyle in young women before they consider to conceive.

Looking at middle aged women, in general they don't suffer from chronic diseases yet, but they often have several risk factors for coronary heart disease (CHD), cancer and osteoporosis after menopause.^{29,30,31} Cardiovascular disease develops 7 to 10 years later in women than in men and is the major cause of death in women over the age of 65 years.³² Part of the risks for CHD and osteoporosis in postmenopausal women is established by their lifestyle in the premenopausal

period, ^{29,30,31} so in middle aged women as well lifestyle is an important target for preventing disease in the future.

Preventive care traditionally refers to measures taken to prevent disease and injury and, generally, not to less well-defined goals such as maintenance of independence and wellbeing. With old age, however, the prevalence of ailments and chronic diseases increases, leading to a decrease in independence and wellbeing.³³ Thus in later life the focus for prevention shifts from selected and indicated prevention to health care related prevention, pivotal to improve the quality of life. The focus on multimorbidity and disability as a form of health care related prevention is important because women have more disabilities than men and they also have a longer lifespan characterised by a poor self-rated health (SRH).^{24,35} Morbidity associated with medicines used for prevention of cardiovascular disease is important in older people, leading to common medication-related admissions.^{36,37} Risk behaviour and prevention of cardiovascular disease at older age cannot be disregarded entirely, for prevention of non-fatal cardiovascular disease probably not only improves life expectancy but also functional status and wellbeing.³³ Another reason not to disregard prevention of cardiovascular disease is elevated smoking habits of women and increasing longevity of relatively healthy elderly.

Study aims

Women can benefit from prevention programs offered by their GP since they actually use primary health care services, much more frequently than men. Therefore we aimed to study whether the overrepresentation of women among the visitors in general practice actually reflects women at high risk for lifestyle related diseases and to find an answer to the question whether prevention programs in general practice should be gender sensitive.

The implementation of selective and indicated prevention programs in general practice appears to be difficult. The benefits of prevention - disease prevention can modulate the prevalence and severity of disease and can add to the quality of later years of life¹ – are clear. Therefore we aimed to study the barriers of implementation of prevention programs in GPs practices and what GPs need to successfully implement preventive actions into their daily practice. We aimed to find whether the GP gender affected attitudes and working methods concerning selective prevention, as the GP profession is becoming feminized ³⁸ and medicine is not gender neutral.¹⁹

Finally, we aimed to find windows of opportunity for GPs to address lifestyle in female patients in order to implement prevention for women in all phases of life in general practice.

Research questions

Our study aims lead to the following research questions: (1) whether and how do gender differences of both patients and GPs need to be taken into account when planning and implementing prevention programs? (2) What are facilitators and barriers in the implementation of prevention programs in primary care, and actual readiness of GPs to implement prevention? And (3) what are windows of opportunity for prevention in different stages of life in women?

We started out to study the role of patient's gender in the relation between risk behaviour and use of GP services. Next we studied the history of how prevention programs entered Dutch general practice and we studied the attitudes and working methods of male/female GPs concerning selective prevention in their practice. Lastly, in this thesis we studied windows of opportunities for prevention in three age groups, chosen because they are in an age prior to an important event, phase or change, without actual interference caused by symptoms and/or circumstances that increase the use of primary health care. We chose young women, aged 18-22, because this is, in the majority of women, the age before pregnancy. The period before and during pregnancy is an important target for prevention of lifestyle related risk factors of both mother and child,²⁸ and also a window of opportunity to prevent lifestyle related diseases later in life. We studied women aged 45-49 years old, because these women are predominantly premenopausal. This means that prevention of CHD and osteoporosis can be carried out before the actual disease reveals itself. Moreover, in this premenopausal period we expected less interference with perimenopausal symptoms leading to a higher use of health care services. We selected women aged 70-74 years for several reasons. From a preventive point of view at this age it is effectively possible to add to the quality of later years of life. Moreover, this group is, though mostly retired from work, considered to be still active as volunteer, informal caregiver for their partner or baby sitter for their grand children and thus contributes largely to our social capital. Lastly, an older group would contain less respondents because of possible cognitive disability.

Outline of the thesis

Chapter 2 describes a cross-sectional survey which was conducted to study to what extent gender plays a role in planning a prevention program in general practice, considering the relation between gender, risk behaviour and use of GP services, in order to provide an answer to research question 1. We used respondents' interviews from the Second Dutch National Survey of General Practice in three age groups: 555 respondents aged 18-22; 1005 respondents aged 45-49; and 536 respondents aged 70-74. We studied smoking, alcohol abuse, excessive alcohol intake, use of soft drugs,

overweight, and insufficient physical exercise. We used logistic regression to measure the relation between yearly contact with the GP and risk behaviour by gender, and negative binomial regression to measure the relation between GP consultation rates and risk behaviour by gender.

Chapter 3 shows the history of decision making and implementation of prevention programs in primary health care in the Netherlands, including facilitators and barriers in a historical perspective. This chapter reports on a qualitative study by means of a witness seminar, organised in September 2011, to discuss the decision-making process of the implementation of systematic prevention programs in the Netherlands in the past, thereby adding new perspectives on past events. The extensive discussion was fully audiotaped. The transcript was content-analysed.

Chapter 4 reports on a quantitative study that used a e-mail questionnaire to investigate the readiness of GPs to perform selective prevention of cardiometabolic diseases. We compared attitudes and working methods in selective prevention of cardio-metabolic diseases in a cross-sectional survey among Dutch GPs in 2013 to the results of a comparable study performed in 2008 before the introduction of the module cardio-metabolic risk of the Prevention Consultation guideline in the Netherlands. We emailed a questionnaire to a representative random sample, stratified for gender, of 907 GPs. We also searched for possible gender differences in GPs in attitudes and working methods concerning prevention. A logistic regression model was used to assess the relation between the cohort, GP gender, age and type of practice. In chapter 3 and 4 we provide an answer to research question 2.

Chapter 5 describes a cross-sectional survey which was carried out to study the relation between high risk behaviour and their self-rated health (SRH) in 292 young women aged 18-22 in order to analyze which signs should alert the GP from a preventive point of view. We used respondents' interviews from the Second Dutch National Survey of General Practice.

Chapter 6 presents a cross-sectional survey which was performed to study the risk of two main lifestyle-related problems, CHD and osteoporosis, in 568 women aged 45-49. We used respondents' interviews from the Second Dutch National Survey of General Practice. We aimed to study the relation between these lifestyle related problems and socio-economic status and the use of GP-care of women in this age group, especially those women who run a high risk.

In chapter 7 the results are reported of a cross-sectional survey which was carried out to identify specific combinations of chronic conditions with a significantly higher impact on SRH in 307 older women aged 70-74 in order to identify target groups for proactive action and alertness in primary care. We used respondents' interviews from the Second Dutch National Survey of General Practice. In chapter 5, 6 and 7 we provided an answer to research question 3.

Chapter 8, the final chapter, presents the general discussion together with the clinical implications for practice and suggestions for further research.

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The data used in the chapters 2 and 5-7 originated from the Second Dutch National Survey of General Practice (DNSGP-2) by NIVEL (Netherlands Institute for Health Services Research), which was carried out in cooperation with the National Information Network of General Practice (NIN-GP).³⁹ The DNSGP-2 was performed with the aim of providing information to researchers and policymakers about the role of general practice in the Dutch health care system. Data were collected between April 2000 and January 2002. The study was carried out in 104 general practices in the Netherlands, comprising 195 GPs (in total 165 GP full-time equivalents). The patients listed in these practices (N=385,461) form a representative sample of the Dutch population. To all listed patients a written questionnaire was sent to collect sociodemographic data. An all-age random sample of approximately five percent of the listed Dutch-speaking patients was invited via their GP to participate in a 90-minute health interview survey to collect information on perceived health status, use of health services, lifestyle, attitude towards illness and health and social networks (N=19,685); 12,699 patients responded (64.5%). To avoid seasonal patterns the health interviews were randomly distributed over the year. Apart from the interview data, we also used one-year data derived from the respondents' electronic medical records. For our analyses we selected all respondents in three age groups: a young age group, aged 18-22 years old (women: N=292; men: N=263); a middle age group, aged 45-49 years old (women: N=568; men: N=437); and an old age group, aged 70-74 years old (women: N=307; men: N=229).

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Does prevention of risk behaviour in primary care require a genderspecific approach? A cross sectional study

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Abstract

Background: In planning a prevention program, it is important to know to what extent gender, risk behaviour and GP consultation need to be taken into account.

Objective: To determine whether gender plays a role in the relation between risk behaviour and use of GP services.

Methods: The data used in this study originate from the Second Dutch National Survey of General Practice of 2000-2002. We used respondents' interviews in three age groups: 555 respondents aged 18-22; 1005 respondents aged 45-49; 536 respondents aged 70-74. We studied smoking, alcohol abuse, excessive alcohol intake, use of soft drugs, overweight and insufficient physical exercise in relation to use of primary care and gender.

Results: Almost all risk behaviours were more prevalent in men. Of all studied risk behaviours only smoking was related to yearly GP contact and consultation frequency in relation to gender. Smoking men consulted their GP significantly less frequently than non-smoking men, whereas in women the opposite was the case.

Conclusion: Both consultation rates and yearly contact were significantly lower in smoking men than in smoking women. Preventive actions by means of case-finding, therefore, are less attainable in men than in women. This outcome may create a double setback for Dutch men, as smoking is a major cause of lower life expectancy in men. Recent data show that the underrepresentation of men among consulters in general practice and the excess of smoking men still exists in the Netherlands. This confirms the actual relevance of our findings although obtained ten years ago.

Key words Primary care, gender, smoking / tobacco use, prevention, consultation.

Introduction

The higher morbidity yet longer longevity of women may have created an emphasis on women's health. More men than women smoke, drink alcohol, and are overweight,¹ but they utilize less health care than women.^{2,3} One might ask, therefore, if men are shortchanged on health. Pinkhasov et al. even hypothesized that this high risk behaviour and low utilization of health services may contribute to the higher mortality in men.² Gender plays a role in people's utilization of health care and reasons for consultation. Reasons for consultation in primary care are different for men and women. Health status and physical symptoms are of greater importance in consultation by men, and factors related to screening and health education, obstetrical diagnoses and disorders of the genitourinary system are of greater significance among women.^{3,4} To our knowledge, the relation between gender differences in risk behaviour and use of primary health care is unknown.

Risk behaviour affects health and life expectancy but can also be used as a focus for preventive actions. For instance, smoking cessation is a key strategy for decreasing the burden of smoking- related death and disability.⁵ There is clear evidence that General Practitioner (GP)-based health programs have a modest and variable effect on health outcomes such as lifestyle change.⁶ To improve this effect, GPs need to offer lifestyle advice routinely and repeatedly or they should direct their efforts towards high-risk groups where the potential for substantial change may be greater.⁶

GPs are ideally placed for preventive medicine and health promotion in the form of early enquiry about patients' lifestyles and for providing information and counseling concerning risk factors.⁷ They are important professionals for disease prevention as about three quarters of all people consult their GP at least once a year .⁸ Moreover, most patients do not object to the organization of preventive care through case finding and risk monitoring in primary care.⁹ Dutch GPs have a central position in health care as gatekeepers to secondary care, and access to Dutch GP-care is considered very good.

In planning a prevention program for high-risk groups in primary care, it is important to know whether gender, risk behaviour and GP-consultation are variables that should be taken into account and to what degree. We wanted to know whether prevention by means of passive case-finding was applicable to both men and women in primary health care. The aim of this study, therefore, was to determine whether gender played a role in the relation between risk behaviour and the use of GP services. We studied this in three age groups (young, middle, and old age) to find out whether age also played a role in the relation between risk behaviour and gender. We hypothesized that both men and women with high risk behaviours consulted their GP more frequently than men and women with low risk behaviours. We studied gender and age differences in the relation between people's use of primary health care and the risk behaviours of smoking, alcohol

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abuse, excessive alcohol intake, use of soft drugs, overweight, and insufficient physical exercise. We controlled for Self-Rated Health (SRH) and Socio-Economic Status (SES) because SRH and SES are potential confounders that affect the use of GP care, although only a few studies have specifically assessed the influence of SRH on gender differences in use of GP services.^{10,11}

Methods

The data used in this study originated from the Second Dutch National Survey of General Practice (DNSGP-2) by NIVEL (Netherlands Institute for Health Services Research), which was carried out in cooperation with the National Information Network of General Practice (NIN-GP).¹² The DNSGP-2 was performed with the aim of providing information to researchers and policymakers about the role of general practice in the Dutch health care system. Data were collected between April 2000 and January 2002. The study was carried out in 104 general practices in the Netherlands, comprising 195 GPs (in total 165 GP full-time equivalents). The patients listed in these practices (N=385,461) form a representative sample of the Dutch population.

An all-age random sample of approximately five percent of the listed Dutch-speaking patients was invited via their GP to participate in a 90-minute health interview survey (N=19,685); 12,699 patients responded (64.5%). To avoid seasonal patterns the health interviews were randomly distributed over the year. Apart from the interview data, we also used one-year data derived from the respondents' electronic medical records. For our analyses we selected all respondents in three age groups: a young age group, aged 18-22 years old (N=555); a middle age group, aged 45-49 years old (N=1005); and an old age group, aged 70-74 years old (N=536). These age groups were chosen to avoid other causes for GP consultation in the female respondents, such as pregnancy in the young age group and menopause in the middle age group. The oldest group was chosen because, from a preventive point of view, it is effectively possible to add to the quality of life at this age. An even older group (> 75), finally, would have contained fewer respondents because of the higher prevalence of cognitive disability.

Self-reported risk behavior

The following self-reported indicators were used: smoking, alcohol abuse, excessive alcohol intake, use of drugs, overweight, and insufficient exercise. Smoking was defined as a positive answer to the question whether the respondent to the health interview was actually a smoker. Alcohol abuse was defined as two or more positive answers to the CAGE questionnaire: Have you ever felt you should Cut down on your drinking? Have other people Annoyed you by criticising your drinking? Have you

ever felt Guilty about drinking? Have you ever taken a drink in the morning to steady your nerves or get rid of a hangover (Eye-opener)?¹³ More than 21 standard alcoholic drinks a week for men, and more than 14 standard alcoholic drinks a week for women were considered excessive alcohol intake. Use of drugs was defined as a positive answer to the question whether soft drugs had actually been used in the past two months. Soft drugs such as hashish and marihuana are drugs that are regarded to pose fewer risks to public health than hard drugs such as heroin, cocaine, LSD and ecstasy. The group of hard drug users proved to be so small that we only included soft drug users. A Body Mass Index (BMI) of 25 or higher was considered overweight; a BMI between 18 and 25 was considered a normal weight, and a BMI below 18 was considered underweight. Insufficient physical exercise was defined as less than 30 minutes of exercise during five days a week.

GP consultation

We determined both whether someone had or had not had contact with their GP in the year of the interview and, if so, the number of consultations in the year of the interview. Data to determine GP consultation rate were derived from the respondents' electronic medical records.

Self-Rated Health

SRH was operationalized as the score on the general perceptions scale of the Short-Form 36. The question asked was: In general, would you say your health is: excellent, very good, good, fair or poor.¹⁴ A Dutch version had been validated previously.¹⁵

Socio-Economic Status

SES was determined by the self-reported highest accomplished educational level, divided into three groups: lowest (none or primary education), middle (lower secondary professional education), and highest (high school and university) educational level.

Analyses

Statistical analyses were performed with SPSS statistical software for Windows. χ^2 -analysis was used to test for bivariate relations between risk behaviour and gender. An independent samples T-test was used to test for gender differences in respondents' use of GP services. A logistic regression model was used to assess the relation between yearly contact with the GP and gender, risk behaviour, and age group. We added interaction terms into the model to look for a moderating effect of gender on the relation between risk behaviour and yearly contact with the GP. Negative binomial regression was used to model the relation between consultation rates as a dependent

variable and both risk behaviour and gender as independent variables. We added interaction terms into the model to look for modifications in the relation between risk behaviour and SRH, and consultation rates by gender. Non-significant interaction terms were removed from the models. SES and SRH were used as control variables in both models and were not removed, even if they did not attain statistical significance. We considered a P-value of less than 0.05 as significant.

Results

Data of 2069 men and women were included. Table 1 shows the characteristics of the men and women who took part in the study.

Age groups	Risk factor	Men	Women	Р
Young (18-22)	Smoking	42%	33%	0.029
	Alcohol abuse	11%	5%	0.009
Men: 263 (47%)	Excessive alcohol intake	25%	6%	0.000
(mean age men 20.13)	Insufficient physical exercise	41%	43%	0.613
	Use of soft drugs	8%	7%	0.092
Women: 292 (53%) (mean age women 19.76)	Overweight	17%	13%	0.066
Middle (45-49)	Smoking	41%	37%	0.263
	Alcohol abuse	12%	7%	0.150
Men: 437 (43%)	Excessive alcohol intake	16%	11%	0.018
(mean age men 46.97)	Insufficient physical exercise	43%	37%	0.056
	Use of soft drugs	2%	1%	0.005
Women: 568 (57%) (mean age women 46.99)	Overweight	57%	40%	0.548
Old (70-74)	Smoking	24%	14%	0.004
	Alcohol abuse	4%	٥%	0.008
Men: 229 (43%)	Excessive alcohol intake	8%	3%	0.018
(mean age men 71.98)	Insufficient physical exercise	37%	54%	0.000
	Use of soft drugs	0%	٥%	0.467
Women: 307 (57%) (mean age women 71.89)	Overweight	60%	61%	0.548

Table 1: Characteristics of risk behaviour in Dutch men and women in three age groups (data collected in 2000-2002)

Risk behaviour: age and gender

Table 1 shows the risk behaviour characteristics. In all age groups, the number of smoking men was higher than the number of smoking women. Alcohol abuse occurred more frequently in men than in women in all age groups, and excessive alcohol intake was found more frequently in men than in women as well. Use of soft drugs was low in all age groups. In the young and middle age groups, more men than women were overweight. In the oldest age group, slightly more women were overweight. Insufficient physical exercise was higher in young and old women than in young and old men; in the middle age group, insufficient exercise was higher in men than in women.

Use of GP services

In all age groups, more women than men consulted their GP at least once in the year the interviews were held. Gender differences in yearly GP consultations were statistically significant (P<0.001) for the young and middle aged groups whereas this gender gap disappeared in the older age group (P=0.132) (Table 2). The women's consultation rate was also higher than the men's consultation rate. This difference was statistically significant in all three age groups (P<0.001 for all groups) (Table 2).

Table 2: Number of Dutch men and women in three age groups consulting their General Practitioner yearly and consultation rate in the year the interview was carried out (data collected in 2000-2002)

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	≥1 GP consul-	≥1 GP consul-	Р	Consultation	Consultation	Ρ
	tations in men	tations in women		rate in men	rate in women	
Young	161 (60%)	244 (82%)	0.000	1.8	4.0	0.000
(18-22)						
Middle	316 (72%)	473 (83%)	0.000	3.3	5.0	0.000
(45-49)						
Old	191 (82%)	273 (87%)	0.132	5.8	8.6	0.000
(70-74)						

Risk behaviour in relation to use of GP services

Of all risk factors we studied, only the relation of smoking with yearly GP contact was significantly modified by gender (P=0.040) (Table 3). The coefficients of gender, smoking, and gender by smoking in Table 3 demonstrate that smoking men have less GP contact than non-smoking men, and that this relation is reversed in women.

Table 3: Relation between risk behaviour and yearly contact with the General Practitioner by age group
and gender in the Netherlands
(data collected in 2000-2002)

Parameter	Beta	Р	Odds Ratio	95%- C.I.
Male (ref. female)	-0.802	0.009	0.449	0.247-0.816
Age		0.004		
Young (18-22)	-0.605	0.001	0.546	0.378 – 0.788
Middle (45-49)	-0.450	0.005	0.638	0.465 - 0.874
Old (70-74)	ref.			
Smoking (ref. not smoking)	0.206	0.290	1.229	0.839-1.799
Gender (male) by smoking	-0.511	0.040	0.600	0.368 – 0.977
BMI		0.477		
BMI < 18	-0.350	0.336	0.705	0.345 – 1.438
BMI 18-25	0.058	0.644	1.060	0.828 - 1.357
BMI > 25	ref.			
Alcohol abuse (ref. no alcohol abuse)	0.367	0.130	1.444	0.897 - 2.324
Excessive alcohol intake (ref. no excessive alcohol intake)	-0.216	0.217	0.806	0.572 - 1.135
Sufficient physical exercise (ref. insufficient physical exercise)	0.003	0.979	1.003	0.798–1.261
Use of soft drugs		0.067		
Current use of soft drugs	ref.			

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Parameter	Beta	Р	Odds Ratio	95%- C.I.
Use of soft drugs in the past	-0.589	0.139	0.555	0.254 - 1.211
No use of soft drugs ever	-0.105	0.770	0.900	0.445 - 1.823
SRH		0.000		
Excellent SRH	ref.			
Very good SRH	0.177	0.543	1.194	0.675 – 2.112
Good SRH	0.175	0.509	1.191	0.709 - 2.002
Fair SRH	1.904	0.000	6.714	2.745 – 16.418
Poor SRH	0.591	0.456	1.806	0.381 - 8.564
SES		0.353		
Lowest SES	0.167	0.243	1.182	0.893 – 1.564
Middle SES	0.213	0.175	1.237	0.910 – 1.683
High SES	ref.			
Gender * SRH		0.005		
Gender (male) by excellent SRH	ref.			
Gender (male) by very good SRH	0.109	0.768	0.768	0.541 - 2.297
Gender (male) by good SRH	0.681	0.045	1.976	1.017 – 3.840
Gender (male) by fair SRH	-0.966	0.078	0.381	0.130 - 1.115
Gender (male) by poor SRH	0.908	0.376	2.479	0.332 - 18.501

The relation between age and GP consultation rate attained statistical significance (P<0.001). People from the old age group consulted their GP twice as much as people from the young age group. Gender did not have a statistically significant moderating effect on the relation between consultation rate and the risk behaviours of alcohol abuse, excessive alcohol intake, use of drugs, overweight, and insufficient exercise; gender only had such an effect on the relation between consultation rate and smoking (P<0.001). Estimated marginal means of the negative binomial regression showed that smoking men consulted their GP less frequently than non-smoking men (expected mean consultation rate 3.08 vs. 4.28 times a year), whereas smoking women consulted their GP more frequently than non-smoking women (expected consultation frequency 6.26 vs. 5.74 times a year) (Table 4).

Table 4: Estimated marginal means of GP consultation rate for Dutch men and women for smoking
(data collected in 2000-2002)

Gender	Risk behaviour	Mean	95%-Confidence Interval
Men	Smoking	3.08	2.45 - 3.72
	Not smoking	4.28	3.41 - 5.14
Women	Smoking	6.26	4.94 - 7.57
	Not smoking	5.74	4.57 – 6.90

Discussion

Summary of main findings

We hypothesized that men and women with high risk behaviours would consult their GP more frequently than men and women with low risk behaviours. However, we found that men consult

their GP less than women, but whereas smoking women see their GP more often, smoking men stay away even more from their GP, resulting in the estimated consultation rate of smoking men being half that of smoking women. A GP, therefore, sees a smaller proportion of smoking men than of smoking women, both as a result of a lower consultation rate and less yearly contact. Preventive actions by means of passive case-finding, i.e. on the occasion of a consultation by the patient for another reason, are therefore less attainable and successful in men than in women because of men's lower attendance.

This outcome may create a double setback for men, considering that several studies have shown that smoking is the most important cause of lower life expectancy in men and the contribution of smoking to sex difference turned out to be up to 40%-60%.^{16,17}

Comparison with existing literature

Pinkhasov et al. also discovered this double setback,² but, in contrast to their study, we discovered a direct gender disparity in risk behaviour and in use of GP services to the detriment of smoking men in particular. We observed that the group that is most in danger, smoking men, is the group that shows the lowest utilization of primary health care.

Alcohol abuse, excessive alcohol intake, use of soft drugs, overweight, and insufficient exercise showed no significant gender difference in consultation frequency or yearly contact with the GP.

Almost all risk behaviours were more prevalent in men than in women. These outcomes are in conformity with earlier outcomes.² Age was not a significant interaction term in any analysis.

Strengths and limitations of the study

The strength of this study is that we focused on a group of men and women with good access to GP services, providing us with self-reported data on their health and health behaviour and data derived from the electronic medical records on use of GP services. By using a nationwide representative survey (the DNSGP-2), we had a high response rate.

A limitation of our study is that, even though the response rate was high, the respective subgroups were small. Secondly, we used the highest accomplished educational level as proxy measure for SES. Income and education are correlated, but not interchangeable.¹⁸ Because education is a more constant measure of social status over one's lifetime than variables such as income or residence,¹⁹ however, we used this parameter to define SES. Furthermore, we used self-reported data, which may have involved underestimation of risk behaviour. Another limitation is the fact that our data are ten years old. Based on data from the Dutch Expert Centre on Tobacco Control (STIVORO)²⁰ and the Dutch Central Bureau for Statistics (CBS)^{21,22} we can conclude that though the

number of smokers has decreased in the past ten years, still more men smoke than women. And though differences in yearly GP contact and consultation frequency between men and women are slightly leveling out we still see a large gender difference in use of primary care. Based on these findings we presume that our conclusions are still valid. The last limitation is the cross-sectional character of the study when we studied the relation between smoking and GP consultation. This may cause a healthy smoker bias: unhealthy smokers may have already quit smoking whereas 'healthy' smokers continue to smoke. Part of the lower number of older smoking women and the constant number of older smoking men annually consulting their GP can be accounted for by this phenomenon.

Implications for practice and research

Men who smoke, consult their GP significantly less frequently than women who smoke. Preventive actions by means of passive case-finding, therefore, might be less attainable and less successful in men than in women. Consequently, prevention by means of passive case-finding is more applicable to women than to men in primary care and there is less need for a proactive invitation strategy in women compared to men. In order to lower risk behaviour in men, we need public health activities or special primary care programs that target people who have fewer GP contacts. Furthermore, we recommend finding strategies to positively influence the knowledge of smoking and smoking cessation and readiness to promote smoking cessation by other health care providers such as dental professionals and occupational physicians. Whether or not GPs are willing and able to organize prevention programs requires further exploration, although we know that, despite the increase in workload this involves, GPs are positive about health promotion and lifestyle counseling.⁷

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Prevention in primary care: facilitators and barriers to transform prevention from a random coincidence to a systematic approach

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Abstract

Rationale, aims and objectives: The Dutch general practitioner (GP) plays a substantial role in prevention. At the same time many GPs hesitate to incorporate large scale cardiovascular risk management (CVRM) programs into their daily practice. By exploring facilitators and barriers occurring during the past three decades we wish to find clues how to motivate professionals to adopt and implement prevention programmes.

Methods: A witness seminar was organised in September 2011, inviting key figures to discuss the decision-making process of the implementation of systematic prevention programs in the Netherlands in the past, thereby adding new perspectives on past events. The extensive discussion was fully audiotaped. The transcript was content-analysed. Results: We came across four different transitional stages: 1. the conversion from GPs disputing prevention to the implementation of systematic influenza vaccination; 2. the transition from systematic influenza vaccination to planning CVRM programs; 3. the transition from planning and piloting CVRM programs to cancelling the large scale implementation of the CVRM program and 4. the reinforcement of prevention. **Conclusions:** The GPs' fear to lose the domain of prevention to other health care professionals and financial and logistical support are the main facilitators for implementing prevention programs in primary care. The main barriers for implementing prevention are the combination of insecurity about reimbursement and lack of scientific evidence. It appears that the ethical view of GPs that everyone should have the same right to obtain preventive care gradually takes over the inclination to hold on to evidence based prevention.

Key words prevention, primary care, implementation, witness seminar, qualitative research, cardiovascular risk management.

Introduction

Over the past decades gradually elements of population-based preventive care have been introduced in general practice, which is traditionally characterized by an individually centered curative approach. One might conclude that primary care is in a transition from the individually centered care of the 20th century to a more population-oriented care in the 21st century. An important motive for incorporating prevention of diseases in healthy people into primary care is the necessity of integrating prevention and cure.^{2,2} If there is a relation between disease prevention and the patient's current state of health, the patient's compliance with follow-up advice may be stimulated.²

In the Netherlands, as in many other countries, the general practitioner (GP) has the best access to individuals at risk because all Dutch citizens are registered with a general practice, and approximately 75% visit their GP at least once a year.³ Moreover, GPs keep medical records of all listed patients.

In 1995, the Ministry gave a grant to implement the project "Prevention: tailor-made". In the framework of this project, GPs have been supported in organizing and implementing influenza vaccination ever since 1997. In the same year the organization of cervical cancer screening by GPs became a reality.²

Nowadays, the Dutch GP appears to be increasingly motivated to perform preventive actions in primary care, and has been playing an ever-enlarging role in the systematic influenza vaccination and cervical cancer screening in the Netherlands. At the same time we see that many GPs still hesitate to incorporate other selective prevention programs such as the third step of "Prevention: tailor-made", Cardiovascular Risk Management (CVRM) into their daily practice.

Changes in clinical practice are only partly within doctors' control. Obstacles to change are generally not only in the professional setting but also in the patient, the organization of care processes, resources, leadership, or the political environment.⁴ The translation of identified barriers into tailor-made implementation interventions is still a black box. Structural barriers to the successful implementation of change interventions should therefore be deliberately sought, preferably from the perspectives of different stakeholders in the care process, and as objectively as possible.⁵

It is therefore relevant to know how decision-making and implementation of prevention programs came about and to describe this change process, including facilitators and barriers in a historical perspective. This can provide clues for how to motivate professionals to implement selective prevention programs into their daily practice. Our research question was: What were the facilitators and barriers in the process of implementing prevention in primary care over the past

three decades? Our main focus was the implementation of CVRM, but we started our discussion with all prevention programs.

In the Netherlands two associations of GPs are active, one covering the professional interest (association) and the other the scientific basis for the profession (college). More than 90% of the GPs is a member of both organizations. With regards to prevention they broadly overlap each other. For reasons of clarity we therefore talk about associations of GPs, or when the difference between the organizations needs to be emphasized we use the terms "association" and "college".

Methods

Witness seminar

We used a qualitative approach in a witness seminar to answer our research question. This method was developed by the Institute of Contemporary British History (ICBH) as a special type of oral history in which experts, researchers and policy-makers are invited to meet in order to explain and debate their recollections of a particular subject at a certain period in time.⁶ This enables researchers to elaborate on developments in the past. The advantage of using this method to investigate the subject of prevention in primary care in the Netherlands is that it may generate a better understanding of aspects that were relevant in the process of debating and implementing prevention from the viewpoint of different stakeholders.

Study sample

By means of published literature and recollections of several GPs who were involved in the prevention debate we identified potential witnesses. They had been either involved as board members of the Dutch GP associations, primary care policy or scientific research or had been particularly involved in the prevention debate. Eighteen witnesses who were involved in the past discussions and decision-making processes were invited personally, by e-mail and/or by letter to participate. Ten of them consented to join the discussion. As three of them had to cancel for logistical reasons, seven participants attended the seminar. The meeting was chaired by an independent chairperson. The meeting was introduced outlining the historical events in order to activate the memories of those attending the seminar. One interview with an additional witness was performed by telephone afterwards to check details that came up during the seminar.

Analysis

The 3-hour meeting took place in September 2011 and was fully recorded. Three researchers (HV, IA and FS) were present as observers. The entire discussion was transcribed verbatim. The transcript was checked for completeness and accuracy by comparing the typed and audiotaped versions. A full copy of the transcript was sent to all participants for correction. Amendments were only allowed for matters of style or for mistakenly remembered facts such as names or dates. The quotes were translated from Dutch into English.

The transcript was independently analyzed. Consistency and inter-coder agreement were obtained by analyzing and discussing the codes by two of the researchers (HV and IA) and after that, by discussing and creating a theory by three of the researchers (HV, FS and AL). The key points were marked with a series of codes, which were extracted from the text. The codes were grouped into similar concepts, and the concepts were grouped into categories. The central themes identified were divided into facilitators and barriers to the implementation of prevention. The facilitators and barriers will be presented based on the implementation process of prevention divided in four stages of transition. These transitional moments were characterized by a change in the relation between facilitating and impeding factors and/or an important contextual event or decision. This process of implementation will be described according to the facts mentioned during the seminar and will be illustrated by quotes.

All identified codes were grouped into four main categories: 1, Social context; 2, professional context; 3, organizational context; and 4, personal motives. This classification is according to a theoretical perspective of Oxman and Flottorp,⁷ completed with personal motives.

Results

The witnesses discussed the implementation of systematic influenza vaccination to provide an example of the discussion on the implementation of prevention in primary care. Gradually the chairman shifted the focus to CVRM to describe the process following the implementation of systematic influenza vaccination. The implementation of cervical cancer screening was disregarded during the seminar for this did not seem to represent a major topic for discussion in the Netherlands. Table 1 shows the characteristics of the witnesses.

We came across four different transitional stages.
Sex	Function (in the past)
Male	Board member and head of guideline development department of the college
Male	Board member of the association
Male	Board member of the college and researcher
Male	Team leader prevention and education of patients of the college
Male	Researcher and involved in the project Prevention: tailor-made
Male	Head of guideline development department of the college
Male	Board member of the association and of the college
Female	Minister of Health

Table 1: characteristics of the witnesses, September 2011

Stage 1. The introduction of prevention in primary care (roughly 1985-1993)

The first stage comprises the conversion from GPs disputing prevention to GPs being persuaded by the associations of GPs to implement the systematic administration of influenza vaccinations in their practice. Table 2 shows the facilitators and barriers characterizing this stage.

During the mid 1980s, a substantial part of Dutch GPs had no intention to implement prevention tasks in their daily work as they regarded prevention as not falling within their remits. The arguments made by Wilson and Jungner in the WHO-document 'Principles and practice of screening for disease' were used as arguments.⁸

"[...] We saw, very typical, as usual, the dialogue or rather the non-dialogue of the so-called pioneers or evangelists and the skeptics. This has been going on all the time. And these kind of undulations have, as I stated there very vigorously, very much to do with the fact that the advertisement [for prevention] is much larger than what it brings about. That is the scientific part of what they say, that it works so well, but look at the evidence: very poor." (Participant 1).

Table 2: facilitators and barriers characterizing the first stage of implementing prevention, (roughly 1985
1993).

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	Facilitators	Barriers
Social context	 Influence from politicians, policy makers and pharmaceutical companies Associations of GPs working well together Strategic motives, such as ICT, positioning the GP and primary care 	
Professional context	 Reasonable scientific evidence based on literature Corresponding to daily practice and existing pilots Position and responsibility: prevention should be for everyone (equity) and is a part of primary care Atmosphere: quietness in the profession 	 Scientific evidence: difficulty to meet the criteria of Wilson and Jungner Position and responsibility: prevention is not a part of primary care Atmosphere: agitation in the profession
Organizational context	- Sufficient logistic and practical support and Finances	
Personal motives	 Personal motives: PhD-thesis on prevention and little resistance from an influential opponent 	

Over the next couple of years, prevention projects started in the context of scientific research. The majority of the members of the associations of GPs still voted against the implementation of influenza vaccination in general practice, with as main argument that curative care, and not prevention, was the core business of the GP.

"Then we used a tactical maneuver to get it accepted: 'Let's vaccinate for one year, supported, well paid, you will be supported by one of the districts, all you have to do is vaccinate, so to speak. One year, give us one year'." (Participant 2)

A one-year implementation-pilot was agreed. An argument for the associations' board to propose to implement systematic influenza vaccination was the positioning of the GP in the centre of the field of prevention.

"I think there was a defensive strategy present as well to enlarge the task of the GP. [...] But also an ideological argument." (Participant 2)

The board was aware that the only way to get prevention programs implemented was by guaranteeing financial support. When the pilot was evaluated after one year, a large majority of the GPs wanted to proceed.

"I still remember his name. He stood up and said: 'It's not our job as GPs', I remember. But than two others stood up and said: 'We've never made this much money in one afternoon, so shut up!'." (Participant 2)

In the early 1990s it turned out that many professionals intended to take up influenza vaccination.

"It appeared that everyone wanted to pick it up: the Municipal Health Services wanted to do it, the pharmacists made very good money with it." (Participant 3)

What argued in favor of the GPs were the electronic information systems that were already being used in primary care, tailor-made for identifying people at high risk. The government believed that the vaccination level could be improved if GPs were more involved. Prevention policy turned out to be an important vehicle for showing ambition and a joint annotation of the associations of GPs was requested by the Minister of Health. Interference from the Ministry of Health did not go beyond financing the influenza vaccination, education and publicity.

"Yes, in our opinion it has always been like that when the profession does its job, then we generally don't have to interfere that much. [...] So financially, the Ministry of Health encouraged it. But it originated totally from the organizations of GPs". (Participant 4)

The scientific evidence base for influenza vaccination, however, was not very strong.

"Today I regard it as a kind of mark on my soul, like, you did not have to allow this to happen. [...] In my opinion the influenza vaccination program should never have passed for scientific reasons." (Participant 1)

Others were critical as well.

"Fifty-seven percent degree of protection. Immensely low. I always say wherever I come that we have a frigging vaccine, which is the truth, but because we vaccinate so many people it's in an absolute way still something you have to trust. [...] I wasn't there when the board said that they had to follow a guideline, but I kept calling for one of course. Why? Because my PhD research subject assumed a guideline and otherwise there was none." (Participant 3)

The GP guideline on influenza vaccinations was authorized in 1993. The evidence available in those days was considered sufficient by the associations of GPs.

In conclusion: the implementation of systematic influenza vaccination in general practice turned out to be successful in this stage because the main facilitators (the fear to lose the domain of prevention to other health care professionals and financial and logistic support) gradually prevailed over the main barriers (lack of scientific evidence and the opinion of GPs that prevention is not falling within their remits). The success of the implementation is demonstrated by increasing vaccination levels (from 28% in 1991 to 74% in 2007, after this year the levels stabilized).⁹

Stage 2: So far, so good: from influenza vaccination to planning and piloting CVRM (1993-1999)

The second stage comprises the transition from systematic influenza vaccination to discussing and even planning and piloting CVRM programs. Table 3 shows the facilitators and barriers characterizing the second stage.

In 1995, the associations of GPs launched the "Prevention: tailor-made" program. The implementation of influenza vaccination and cervical cancer screening proved to be successful. The need to combine the pre-existent guidelines on hypertension and hypercholesterolemia into one guideline, together with the presence of ICT facilities in primary care to identify high-risk people, were arguments for the GP associations to choose CVRM next.

[The fact that others would pick this up] "was not an argument. [...] When high-risk people need to be identified GPs are the only ones who can do this, owing to the data in their medical records". (Participant 5)

Scientific arguments were present as well. Trials were already performed to test the effects

of cardiovascular disease (CVD) prevention performed by the practice nurse. Lastly, available

funding was an important argument for choosing CVRM as a focus point for prevention.

[The choice for CVD] "I think [...] had to do with the fact that the trials were very easily funded by the Dutch Heart Association, which was of course a very rich club". (Participant 6)

In 1996 the associations of GPs insisted on the support of a practice nurse within the practice in order to implement the CVRM program properly.

"We picked it up but it took us, the board, the next three, three and a half, almost four years to obtain actual support within the practice". (Participant 2)

 Table 3: facilitators and barriers characterizing the second stage of implementing prevention, (1993-1999).

Twenty-three main codes were identified at this stage and were grouped into the four main categories.

	Facilitators	Barriers
Social context	 Pressure to screen people of 60 and over by the funder of the research Unity in the associations of GPs Use of ICT, stronger position of GP and prevention to acquire support 	
Professional context	 Scientific evidence: CVRM pilots work, theoretical 50% reduction of risk, guidelines are already evidence based Corresponding to daily practice: guidelines were not new Less discussion because CVRM is secondary prevention and an improvement of care 	No scientific evidence for primary prevention CVD
Organizational context	 Facilitating prerequisites: sufficient logistic and practical support and finances Large group of people with risk for CVD 	The application of measuring blood pressure in all people of 60 and over is suspect
Personal motives	PhD was motivated to implement PhD- Subject	

This was facilitated by an increase of the capitation fee and fee for service.

Arguments about prevention not being the task of the GP were degraded by the discussion whether CVRM was prevention or rather an improvement of quality of care.

"It was about a better treatment for people who were already included under care. This was true for diabetes, but also for hypertension. For years, then, this was the most important portal for discussing CVD altogether. In those days, it was about secondary prevention [...]. This is an improvement of existing care, which is really not so bad". (Participant 1)

The identification of people at high-risk had already been described in the existing guidelines on hypertension and hypercholesterolemia. In planning the CVRM program, the funder of the program insisted on continuing to measure blood pressure in all people of 60 years and over, as was already described in the guideline on hypertension, forcing the implementation of a screening program on people whose risk was unknown.

"That in-depth discussion [of available evidence for the reduction of morbidity by prevention] was never held in our group, because the guidelines were the starting point, and these guidelines implied that there was evidence for treating or advising people with high risk of CVD". (Participant 5)

At the end of the 1990s 1,000 of the 8,000 Dutch GPs participated in a CVRM pilot-program. In the same period, however, a discussion on income and supporting personnel started in the GP associations.

In conclusion: planning and piloting the CVRM programs in general practice turned out to be successful in this stage because the positive arguments concerning the present scientific evidence outweighed the negative arguments. Moreover, GPs had a stable position in health care politics illustrated by governmental support, by means of an increase of the capitation fee and fee for service. This governmental support created, but also resulted from, a stable position of the Dutch GP.

Stage 3: When pilots become policy political tensions break out (1999-2000)

The third stage is characterized by the transition from planning and piloting CVRM programs to cancelling the CVRM prevention project. Table 4 shows the facilitators and barriers characterizing the third stage.

When pilots were to become policy the barriers started to outweigh the facilitators. At the end of the 1990s discussions on GPs' wages caused an uproar.

"It was a booming time when they said: 'The lawyer with whom I graduated makes six times more money than I do'." (Participant 2)

The board of the association of GPs insisted on employing practice nurses in prevention programs. An agreement with the Minister of Health was signed in 1999. But tensions ran even higher, both in the board and in the profession.

"The board [of the college of GPs] insisted on proceeding, on the condition that more research should be done on the effectiveness of screening people for CVD risks over the age of 60". (Participant 5)

	Facilitators	Barriers
Social context	- Advice from the college to start with CVRM	 Tension within the profession and between the two associations
	- Pressure to proceed under the condition that more research would follow on screening	 Cancelling CVRM as a signal to the Ministry of Health and creating an enemy to obtain unity in the profession
Professional context	A successful pilot in 1,000 GP practices	 Insufficient scientific evidence to persuade the GPs Hesitation to start with another prevention theme
Organizational context		nsufficient payment and tension about reimbursement of the implementation of practice nurses

Table 4: facilitators and barriers characterizing the third stage of implementing prevention, (1999-2000). Fifteen main codes were identified in this stage and were grouped into three main categories.

In spite of actions to influence the opinion forming process such as publications in the Dutch Journal of the Medical Association, distrust and insecurity whether practice support would be implemented and financial motives led to the cancellation of the large scale implementation of the CVRM program at an association members' meeting in 2000.

GPs were irritated with the Ministry of Health, and throwing out the program was a way to show their irritation.

"What I also heard from people within [the college] is that this item was on the agenda of that members' meeting quite by chance. Had this item been on the agenda two months later, and had a mental health project been on the agenda at this meeting, then this [mental health] project would have been thrown out." (Participant 5)

In response to the situation, the Ministry regarded that more funding for CVRM was not on the agenda. The Ministry of Health stated that they had already made an effort to obtain sufficient financial support for employing practice nurses. This led to a trench warfare between the Ministry of Health and the GPs. The college was aware of the climate of agitation of the GPs, but could not provide sufficient scientific evidence to contradict the financial arguments.

"In my opinion [...], for prevention we need calmness in the profession. Then GPs are certainly willing to listen to good arguments for performing prevention programs. Adequate financial compensation is also required." (Participant 2)

In conclusion: the actual implementation of the CVRM programs in general practice was not successful in this stage because of the main barriers in this stage, being discontent about income among GPs, agitation in the profession towards the Ministry of Health because of insecurity about financial and logistic support. Moreover, scientific evidence and the facilitators that were present appeared to be insufficient as a counterbalance.

Stage 4: Let's start all over again... (2000-present)

The fourth stage was characterized by the transition from cancelling the CVRM program to enforcing prevention via the introduction of a so-called Prevention Consultation. Table 5 shows the

facilitators and barriers characterizing the last stage.

After the CVRM program had been cancelled, a quarrelsome atmosphere lingered for years, mainly targeting the Ministry of Health.

"And we just proceeded with the revision of the evidence based GP guidelines. [...] It was decided to update and to cluster the guidelines on separate CVD risk factors into one guideline.". (Participant 7)

Table 5: facilitators and barriers characterizing the fourth stage of implementing prevention (2000present).

Forty-five main codes were identified in this stage and were grouped into three main categories.

	Facilitators	Barriers
Social context	 Funds started with checkups and requested guidelines Associations of GPs started to cooperate again Strategic motives: bringing prevention back by means of revision of guidelines Influence from patients 	 Differences of opinion between GPs and funds Insurance companies did not support prevention as a cost effective way to keep people healthy A cold war between the associations of GPs Strategic motives: no focus on prevention
Professional context	 Scientific evidence was partly present and when not present it was postponed Guidelines were already there, with CVRM an entrance to the guidelines was created Responsibility to offer prevention, equity, the GP as a coach 	 Scientific evidence: trials were unethical, insufficient evidence, harder to obtain evidence in prevention Updating guidelines took all the time, no time left for prevention The GP had to learn people to deal with risk instead of screening
Organizational context	 Finances were present An international guideline became a primary care guideline in the Netherlands The nature of CVRM: screening is non-invasive 	 Only the checkup is reimbursed, the rest is not Insurances companies abuse prevention programs for marketing rather than improving health

Prevention, however, was not on the agenda.

"[Cancelling "Prevention: tailor-made"] was perceived as a defeat, [...], but the foundation and benefit of the whole project remained intact. So if we could bring it back in another way, by updating the cardiovascular guidelines for instance, then that would still be a good thing". (Participant 3)

In these years, all kinds of initiatives were taken outside primary care, such as health checks offered by commercial companies.

"What happened was that those health funds and other suppliers of checkups assumed that they would trace people, that they would measure all kinds of things, that those people would obviously go to their GP if anything was wrong and that those guidelines would then become effective". (Participant 5)

GPs and the media turned to the college of GPs for its opinion. The college formulated a position paper on medical checks for healthy people. The Kidney Foundation, The Diabetes Fund and the Dutch Heart Foundation together took it much farther and requested a guideline on screening for CVD risk.

"On the basis of the principle of equity everyone should have the same right to obtain this kind of care and right now it is just an absolute coincidence." (Participant 3)

Eventually a study group of GPs together with experts from the funds started working together to look for evidence for screening. This led to the Prevention Consultation guideline including a method for screening of people who had no known risk for CVD and to identify people at high risk. When the Prevention Consultation guideline was authorized a so-called disclaimer was published as well, saying that, though the guideline had been approved, the evidence for actively approaching possible high-risk patients was still insufficient.

"It hasn't been proven yet, cost-effectiveness has to be researched, but at this moment I think you cannot miss this opportunity." (Participant 8)

A shift in the interpretation of evidence based, from proven effectiveness to the best evidence available, together with social and professional developments prompted the college of GPs to publish the guideline Prevention Consultation to catch the opportunity.

In 2006 a new system of health care insurance was introduced based on risk equalization, and market forces entered the Dutch health-care system. Private health insurance companies were assigned to regulate health costs in the Netherlands. The associations of GPs hoped that the insurance companies would incorporate prevention in primary care by GPs in their insurance package, instead of prevention activities by other stakeholders.

"But you won't be surprised to hear that for many health insurance companies prevention is a marketing activity, and not at all an activity to keep their policyholders healthier". (Participant 7)

The GPs were under the impression that the Prevention Consultation would be covered as part of the basic insurance package, but this was not the case.

"Ever since 2006 there will never be quietness in the world of healthcare. The GP is pragmatic, so he will find his way. Scientifically powered, but he also has to think about his wallet." (Participant 2)

In conclusion: although the main facilitators in this phase (the availability of various health checks from other parties that prompted the GPs to offer their own checkups and the perceived responsibility to offer prevention for all people at high risk on the basis of the principle of equity) led to the development of the Prevention Consultation guideline, eventually the implementation of prevention programs in general practice was not successful in this stage because financial compensation offered by health insurances was insufficient.

Discussion

We found that in all stages similar facilitators and barriers played a role, and in all stages financial support played a pivotal role. It appeared that facilitating elements, such as the fear of losing the domain of prevention to other health care professionals, political pressure, unity within GPs, and the opinion that prevention is effective, fair and corresponds with daily practice and the principle of equity motivated GPs to take actions in order to introduce prevention, but finances turned out to be a prerequisite for actual implementation.

When other stakeholders tend to take up tasks that are also allocated to general practice, GPs appear to have a strong tendency to pro-actively appropriate more power to themselves, which makes this threat of the domain of primary care an important motivational incentive. We also conclude that gradually the importance attached to evidence diminishes and proven effectiveness is no longer the main motive to pick up prevention. This can either be explained by the fact that evidence on prevention is harder to obtain than evidence on cure. But we also notice that the professional opinion about equity plays a pivotal role for many GPs to take up prevention. The discussion on social health inequities in the Netherlands might have contributed to this shift in opinion.

We found that the main barriers for implementing prevention are the insecurity about financial and logistical support, insufficient scientific evidence, the opinion of GPs that prevention is not falling within their remits, agitation among GPs and friction between the professional organizations with each other and with the Ministry of Health. In the four different stages all categories of arguments had a different impact leading to a positive or negative view on prevention by GPs and therefore leading to a successful or not successful implementation of prevention programs. But insecurity about finances provided by the government and/or health care insurance companies gradually becomes definitely the main motive for GPs to vote against prevention or to hesitate to implement prevention.

Comparison with existing literature

Major difficulties arise when introducing clinical guidelines into routine daily practice. Even if doctors are aware of the evidence and are willing to change, to alter well established patterns of care is difficult. Analyses of barriers to changing practice have shown that obstacles can arise at different stages in the health-care system.¹⁰ We identified a social context, a professional context, an organizational context and personal motives.

To persuade general practitioners into taking up preventive actions a number of requirements have to be met. The first prerequisite is financial and logistical support because of the increasing workload. We found that financial and logistic support stimulated the implementation of systematic influenza vaccination. This was also concluded in implementing type II diabetes guidelines in general practice.¹¹ Huy et al. found that better financial and organizational conditions are facilitators to improve the provision of preventive care in CVRM.¹²

In our discussion scientific evidence turned out to be an important prerequisite and at the same time a continuous cause for debate. But even when evidence is present this will not automatically lead to a better quality of care. The emergence of evidence based medicine has not automatically been very successful in improving the quality of care.¹³ Both in the implementation of influenza vaccination as CVRM programs scientific evidence was not fully present when prevention programmes started. In this light, personal motives and coincidences need to be taken into account when implementing a prevention program.

Strengths and limitations of the study

We chose a qualitative approach owing to the sparse literature about the debate and implementation process of prevention programs in primary care. The strength of a witness seminar is that interaction between the members can contribute to exploring and clarifying individual opinions. Concurrently, the interaction in the group can introduce new issues to the interview, enabling new themes or aspects to materialize.¹⁴

Our results are based on a witness seminar with a group of people with different backgrounds, both GPs and other officials. Seven of eighteen invited participated. We are convinced that those who volunteered to the seminar were the main key players in the debate about prevention. This assumption was confirmed during the seminar. During the seminar and afterwards when analyzing our data, we found that the witnesses were able to cover the whole period of time

we aimed to study. Moreover, many of the facts mentioned during the seminar were confirmed by scientific primary care publications during those periods.

Recommendations for future research and implementation

We recommend that prevention in primary care must be encouraged by reserving money for prevention within a population-based budget, and by working together with the local government and Municipal Health Services and other stakeholders to improve the health of a population. Health insurance companies should be made responsible for prevention as well, translating in a separate and sufficient budget for prevention, at greater length, to create space to develop preventive activities in primary care. We recommend more quantitative and qualitative research to study attitude and readiness to implement prevention in primary care, and lastly, we recommend more research to study evidence for prevention and screening, both for health parameters and for costeffectiveness.

We found these facilitators and barriers in the Netherlands, but our results can inform and support future approaches to implement prevention in primary care in other countries as well. We recommend comparable research in other countries with different healthcare systems to find out to what extent the facilitators and barriers we found are specific for the Netherlands and for the Dutch healthcare system.

Conclusion

Over the years prevention has more and more become the domain of primary care, due to political pressure, but also due to social needs for screening. GPs fearing to lose the domain of prevention to other health care professionals, and financial and logistical support are the main facilitators for the implementation of prevention programs in primary care and financial support plays a pivotal role. Insecurity about reimbursement and lack of scientific evidence are the main barriers. Evidence seems to become less important, and it appears that the ethical view of GPs that everyone should have the same right to obtain preventive care gradually takes over the inclination to hold on to evidence based prevention.

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Selective prevention of cardiometabolic diseases in general practice: attitudes and working methods of male and female general practitioners before and after the introduction of the Prevention Consultation guideline in the Netherlands

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Abstract

Rationale, aims and objectives: In 2011 the module cardio-metabolic risk of the Prevention Consultation guideline was introduced in the Netherlands in order to prevent cardio-metabolic diseases. We aimed to compare attitudes and working methods of Dutch general practitioners (GPs) towards selective prevention of cardio-metabolic diseases before and after the introduction of the guideline and to study the effect of GP-gender on these attitudes and working methods.

Methods: We compared attitudes and working methods in prevention of cardio-metabolic diseases in a cross-sectional survey among Dutch GPs in 2013 to the results of a comparable study performed in 2008.

Results: Both in 2008 and 2013 30% responded. In 2013, more GPs reported to actively invite patients for preventive measurements. 30% of the GPs implemented the module cardio-metabolic risk. In 2013, less GPs reported that it is worthwhile to make an effort to detect patients at increased risk for cardio-metabolic diseases, and more GPs suggested that prevention may be performed by other stakeholders compared to 2008. Financial support and evidence for prevention programs were mentioned as main facilitators for prevention. In 2013, more male than female GPs actively invite patients for preventive measurements.

Conclusions: More GPs report active preventive working methods after the introduction of the Prevention Consultation guideline, but only 30% implemented the guideline. More male than female GPs actively invite patients for preventive measurements. Compared to 2008 less GPs think it is worthwhile to make an effort to detect patients at increased risk and more GPs are willing to delegate preventive actions to other health institutions in 2013. As financial support and evidence for prevention are important facilitators for prevention, further research of the effectiveness of the guideline in preventing cardio-metabolic diseases is necessary, and political choices have to be made in order to financially facilitate selective prevention in general practice.

Introduction

Cardio-metabolic diseases, including cardiovascular disease, diabetes mellitus type 2 and chronic kidney diseases, are responsible for a quarter of all deaths worldwide and are common diseases in the Netherlands.¹⁻⁴ Prevention of these diseases will not only reduce morbidity and mortality, it will also improve quality of life.¹

General practitioners (GPs) are in the ideal position to deliver preventive medicine by enquiring about patients' lifestyles and providing information and counseling about risk factors.⁵ Every Dutch inhabitant is listed with a GP and about 75% of all people consult their GP at least once a year.^{6,7} These contacts offer opportunities for preventive care.⁸ Moreover, Dutch GPs are already involved in systematic prevention programs like influenza vaccination and cervical cancer screening.

In March 2011, the module cardio-metabolic risk of the guideline Prevention Consultation has been introduced in general practice in the Netherlands to improve the early detection and management of patients with an increased risk for cardio-metabolic diseases. As the diversity in available health checks was confusing for the general public, the Dutch Heart Foundation, The Kidney Foundation and The Diabetes Fund together the Dutch College of GPs, the National Association of GPs and the Dutch Association of Occupational Medicine joined forces to develop an evidence based tool for GPs in facilitating selective prevention of cardio-metabolic disease.^{1,9,10} The module consists of a questionnaire, and, if indicated, additional measurements. Each patient listed in the practice between the age of 45 and 70 years old is invited to fill in the questionnaire. In a study to assess the rates of newly diagnosed hypertension, hypercholesterolemia, diabetes mellitus and chronic kidney disease 392 patients (64%) were estimated to have a high risk and were referred to the practice; 36% consulted the GP. In 22% of these patients a new diagnose was identified.²¹

To successfully implement programs to prevent cardio-metabolic diseases, we need to know GPs' attitudes towards selective prevention. In 2008, before the publication of the guideline Prevention Consultation, a cross-sectional survey of attitudes and working methods of Dutch GPs in prevention of cardio-metabolic diseases was carried out. GPs showed a positive attitude towards prevention of cardio-metabolic diseases. They considered that prevention should be focused on patients at high risk.²

Studies show that female GPs practice differently than male GPs.^{12,13} Female GPs have longer patient visits and engage in more patient-centred communication. They provide more counseling and immunization services and female GP gender is associated with a greater likelihood of receiving preventive counseling by both male and female patients.^{14,15} The GP profession is becoming feminized (12). In the Netherlands the number of female GPs increased from 1.961 (25%

of all GPs) in 2000 to 3.532 (40%) in 2010.¹⁶ It is important to understand its implications and to study the effects on patient care and the profession ¹⁷ and on the working attitude towards selective prevention.

The aim of our study was to compare attitudes and working methods in selective prevention of cardio-metabolic diseases before and after the introduction of the guideline. Our research questions therefore were: did the attitudes and working methods of Dutch GPs concerning selective prevention of cardio-metabolic diseases change after the introduction of the guideline Prevention Consultation? What are facilitating factors for a GP to implement selective prevention of cardiometabolic diseases? And lastly, is there a relation between GPs' gender and attitudes and working methods in selective prevention of cardio-metabolic diseases?

The module cardio-metabolic risk of the guideline Prevention Consultation

This module focuses on adults between the age of 45 and 70 years old. All patients in this age group without diagnosed hypertension, diabetes mellitus type 2, cardiovascular disease, chronic kidney diseases or hypercholesterolemia are invited to fill in an online questionnaire, generated to estimate the risk to develop cardio-metabolic diseases. Patients with an increased risk for cardio-metabolic diseases based on the questionnaire are invited to visit their general practice to complete their risk profile with blood pressure measurements and blood tests for cholesterol and glucose. The patient will receive tailored lifestyle advice and/or start with (preventive) drug treatment if indicated.

Methods

Participants

For the cross-sectional survey of Nielen et al. in 2008 a random sample of 1,100 GPs was drawn from the national register of practising GPs of NIVEL (The Netherlands Institute for Health Services Research).² In 2013, we conducted a cross-sectional survey among 907 Dutch GPs. NIVEL delivered a gender stratified random sample of 1.500 names and addresses of GPs from their national register of practising GPs, with 50% of both genders. GP locums were excluded for they are less involved in adopting working methods in general practice. Only one GP per practice was included. Corresponding e-mail addresses were searched via the internet; 907 e-mail addresses were found.

Questionnaire

In 2008 a questionnaire was used that contained questions about attitude and working methods of GPs regarding selective prevention of cardio-metabolic diseases in general practice.² In 2013 we

used the same questionnaire, extended with questions about facilitators and barriers in implementing selective prevention and with a question whether the module cardio-metabolic risk was actually implemented in their daily practice at the time of the survey. Questions about attitude, working methods, facilitators and barriers, were assessed by using a five-grade Likert scale.

A active attitude towards preventive working methods was defined as follows: the GP invited patients for preventive measurements and invited patients for preventive measurements who came to the GPs' office for other complaints. Frequency tables were made and answers to the questions were recoded to "agree" and "disagree" ("disagree" includes "neutral"). In 2008, a paper questionnaire was used, and a reminder was sent after two weeks. In 2013, the questionnaire was sent by e-mail in February. Two weeks later also a reminder was sent by e-mail to maximise response.

Analysis

Statistical analyses were performed with SPSS statistical software 20.0 for Windows. χ^2 -analysis was used to test for bivariate relations between the outcomes cohort (2008, 2013), gender, type of practice (single practice, dual practice, group practice, health centre) and age groups (< 40 years, 40-49 years, 50-59 years, > 60 years). A logistic regression model was used to assess the relation between the cohort, gender, age and type of practice. To explore the moderating effect of gender on the outcome before and after the introduction of the guideline we added an interaction between gender and cohort to the model. Non-significant interaction terms were removed from the model, significant interactions were described in the results. A P-value less than 0.05 was considered to be statistically significant.

Results

GPs' characteristics

In 2008 30% of the random sample of GPs responded (n=330). In 2013, a total of 268 GPs responded and met the inclusion criteria (response rate also 30%). The characteristics of the respondents in 2008 do not correspond with the characteristics in 2013 regarding age (P=0.042) and type of practice (P=0.004). Due to our gender stratified sample more female GPs responded in 2013 whereas in 2008 more male GPs responded (table 1).

	Respondents 2008 N (%)	Respondents 2013 N (%)	p-value	All GPs in the Netherlands in % ¹ n=8.884
Age category	N=330	N=247		
< 40 years old	71 (22)	46 (19)		20
40-49 years old	88 (27)	84 (34)	0.042	31
50-59 years old	147 (45)	89 (36)		38
60 years and older	24 (7)	28 (11)		11
Gender ²	N=330	N=247		
Male	202 (61)	105 (43)	0.000	59
Female	128 (39)	142 (58)		41
Type of practice	N=328	N=247		
Single-handed	101 (31)	55 (22)		18
Duo practice	112 (34)	69 (28)		28
Group practice	79 (24)	88 (36)	0.004	54
Health centre	36 (11)	35 (14)		

Table 1: Characteristics of the study population in 2008 and 2013

1. NIVEL , data from the register of GPs, 2011

2. Stratified sample in 2013

Attitudes and working methods in prevention

In 2008 78% of the GPs reported that it is worthwhile to make an effort to detect patients at increased risk for cardio-metabolic diseases. In 2013 this percentage dropped to 70%. The multivariate logistic regression showed that the odds ratio between the 2013 and the 2008 cohort was 0.634 (p=0.026). Both in 2008 and in 2013 the respondents considered general practice the appropriate setting to detect cardio-metabolic diseases and they considered that preventive measurements must focus on high risk patients (Table 2).

In 2013 more GPs reported to actively invite patients for preventive measurements (33%) compared to 24% of the GPs in 2008, before the introduction of the cardio-metabolic risk module. The odds ratio between the 2013 and the 2008 cohort was 1.743 (p=0.005) (Table 3). Most preventive measurements for detecting patients with an increased risk were carried out when patients are known with risk factors, or when patients explicitly asked for it.

In 2013, 30% of the GPs carried out the cardio-metabolic risk module in their practice. Significantly less GPs in 2013 (79%) than in 2008 (85%) indicated that a module cardio-metabolic risk is useful. The multivariate logistic regression showed that the odds ratio between the 2013 and the 2008 cohort was 0.599 (p=0.026). Less GPs in 2013 indicated that the module may only be carried out by GPs (OR=0.285, p=0.000) (table 4). In 2013 significantly more GPs indicated that a cardiometabolic check may also be performed in other health institutions (Table 5). Table 2. GPs' opinions about selective prevention of cardio-metabolic disease. A comparison before and after the introduction of the Prevention Consultation

quideline, con	trolling	i for ge	nder d	ifferenc	ces, age	e differ	ences a	nnd diff	erence	in tyr	oe of pi	actice,	, a mul	tivaria	ble loq	istic rec	gressio	÷			
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	detect	t patient	s at	risk fo	r cardio-		risk for	cardio-		setting	to detec	ţ	when tl	nere is eı	hguor	suited fo	or a pract	tice	risk for	cardio-	
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	odd s ratio	95% C.I.	٩	odd s ratio	95% C.I.	٩	Odd s ratio	95% C.I.	م	odd s ratio	95% C.I.	۹.	odd s ratio	95% C.I.	٩	Odds ratio	95% C.I.	ط	Odd s ratio	95% C.I.	٩
Cohort (2013, ref 2008)	0.634	0.425- 0.946	o. <i>02</i> 6	0.712	0.484- 1.048	0.085	0.869	0.611- 0 1.234	0.432 0	0.726 C	р.378- с г.392	0.334 C	0.740	237 237	0.251	.026	0.615- 1.712	0.922	1.246	0.718- 2.162	0.434
Gender (female, ref male)	0.882	0.569- 1.368	0.576	0.716	0.468- 1.096	0.124	0.801	0.544- 0 1.179	0.261 0	0.473 6	0.227- 6 0.984	1.045 C	2 627.0	0.414- (283	.273 0	0.628	0.355- 1.110	0.109	1.407	0.767- 2.581	0.270
Age <40 years old	ref		0.011	ref		0.024	ref	0	1.839 r	ef	0	1.565 r	ef	~~~	0.621	ef		0.137	ref		0.26 9
40-49 years old	0.611	0.326- 1.145	0.124	0.452	0.251- 0.811	0.008	1.000	0.612- 0 1.634	9 666.0	0.554 6	0.212- 0 1.451	1.230	L.348 C	765 (0.415	.046	0.490 -	0.908	1.632	o.778- 3.424	0.195
50-59 years old	0.370	0.200- 0.684	0.001	0.431	0.239- 0.778	0.005	0.871	0.532- G	0.583	0.522 (0.198- 0	0 001.0	0.927	0.465- (848	.830	0.684	2.229 0.331-	0.303	1.435	0.700- 2.942	0.324
>bo years old	0.494	0.212- 1.151	0.102	0.638	0.273- 1.495	0.301	0.774	0.377- C	0.485 (0.733	0.166- C 3.245	0.683	L:384 C	0.451- (4.245	0.570	.391	1.411 0.152- 1.015	0.054	3.503	0.921- 13.330	0.06 6
Type of practice Single-handed	ref		0.287	ref		0.877	ref	0).348 r	éf	0	146	éf	~	1.705	ef		0.477	ref		
Duo practice	0.729	0.438-	0.223	1.187	0.720-	0.502	0.840	0-537- 0	0.446 2	2.060 C	0.905-0	0.085 1	1.002	.499- 0	966.0	.022		0.946	1.623	0.834-	0.194
Group practice	1.182	0.688-	o.544	1.216	1.95° 0.732-	o.45o	1.011	1.315 0.643- 0	.962 2	553 ¹	1.060- 0	1 <i>037</i> 0).841 C	2.010 .424- C	619.0	-575	0.549 -1.901	0.195	1.332	3.159 0.695-	0.154
Health centre	0.916	2.032 0.473-	o.793	1.172	2.019 0.617-	0.627	0.620	1.589).341- 0	1116 1	354 C	0.5145 0.514- 0	1·539 0	1.659 C		.314	.446	0.792- 3.131	0.407	3.017	2.554 1.000-	o.387
		1.772			2.228		<u></u>	1.125			3.569			485			0.605 -3.459			9.105	0.050

Table 3. GPs' workin	g method	ls to dete	ect patient	ts with an	increased	d risk for	cardio-m	etabolic (diseases.	A compai	ison befc	re and af	ter the in	troductio	n of the
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	Actively i	nviting pat	cients for	Preventiv	re measurem	ients or it	Preventiv	e measuren who visit the	nents in deneral	Preventiv	e measuren iith known	ients in die k	Both activ	ely inviting tive measu	patients
	(n=572)		2	(n=574)		-	practice for than card	or other cor io-metaboli	e yenerar nplaints ic	factors for diseases	cardio-me	tabolic	and prever	ntive measu who visit t	urements he
							complain (n=572)	t		(n=573)			general pr complaint metabolic	actice for of s than cardi complaints	ther o-
	Odds ratio	95% C.I.	٩	Odds ratio	95% C.I.	٩	Odds ratio	95% C.I.	d	Odds ratio	95% C.I.	٩	Odds ratio	95% C.I.	٩
Cohort (2013, ref 2008)	1.743	1.186- 2.563	0.005	1.395	0.747- 2.605	0.296	1.248	0.877- 1.777	0.219	0.621	0.280- 1.377	0.241	1.499	2.305 0.305	0.065
Gender (female, ref male)	0.646	0.422- 0.989	0.044	1.119	0.571- 2.194	0.742	1.311	0.890- 1.929	0.170	0.862	0.353- 2.104	0.744	o.774 0	0.481- 1.245	0.290
Age <40 years old	ref		0.766	ref		0.610	ref		o.334	ref		0.974	ref	~~~	0.530
40-49 years old	o.975	0.566- 1.680	0.928	0.575	0.227-	0.244	o.698	0.424-	0.157	0.917	0.307- 0.307	0.877	0.743	0.412-	0.322
50-59 years old	0.886	0.513- 0.523-	0.665	/o/.o	1.45/ 0.275- 2.822	0.473	o.8 <i>5</i> 7	0.520-	o.543	1.025	2./39 0.332- 0.367	0.966	0.638	1.330 0.352- 0.352-	0.138
>60 years old	o.668	0.298- 0.298- 1.498	0.328	ref 0.874 1.273	1.698 1.698	0.265	1.160	0.555- 2.424	0.694	1.342	3.10/ 0.237- 7.608	0.740	o.733	0.312- 0.322- 1.726	774-0
Type of practice Single-handed	ref		0.740	1.317		o.749	ref		0.741	ref		0.254	ref		0.647
Duo practice	1.000	0.603- 1.650	0.999		0.417-	0.721	o.988	0.630- 1.r.8	o.957	2.051	0.752- r roo	0.160	0.866	0.489-	0.623
Group practice	1.178	-512.0 1.00.7	0.521		0.565- 2870	0.560	1.204	0.761- 0.761-	0.429	1.546	0.606- 0.606-	0.362	1.126	0.648- 0.628-	0.673
Health centre	1.330	0.712- 0.84	0.371		2.0/0 0.453- 876	0.613	0.917	0.515- 0.515-	0.769	6.089	0.759- 2.867	680.0	1.299	0.654-	0.455

controlling for gender dif	ferences, ac	ge differenc	es and diffe	erences in ty	/pe of prac	tice, a mult	tivariable lo	ogistic regre	ssion.			1
	The mod	ule cardio-n	netabolic	The modu	le cardio-m	netabolic	A cardio-r	metabolic c	heck may	At this mo	mentlcar	y out the
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	Preventic (n=571)	on Consulta		on nign ris	ik patients	(n=509)	(n=507)			in my gen	raio-metai eral practic	0011C
										(n=247)		
	Odds ratio	95% C.I.	д	Odds ratio	95% C.I.	4	Odds ratio	95% C.I.	۹.	Odds ratio	95% C.I.	d.
Cohort (2013, ref 2008)	o.599	0.381-0.942	0.026	o.875 0	0.592-1.291	0.500	0.285	0.189-0.430	0.000			
Gender (female, ref male)	1.044	0.635-1.716	0.866	1.051	0.684-1.615	0.822	0.652	0.424-1.003	0.051	0.668	0.365-1.222	191.0
Age <40 vears old	ref		0.199	ref		0.223	ref		0.623	ref		0.231
40-49 years old	0.776	0.395-1.526	0.463	1.711	0.997-2.935	0.051	1.215	0.699-2.109	0.490	2.082	0.829-5.232	611.0
50-59 years old >60 years old	0.608 1.387	0.313-1.181 0.481-3.998	0.142 0.545	1.364 1.824	0.806-2.308 0.813-4.092	0.248 0.145	0.967 1.385	0.557-1.680 0.630-3.043	0.906 0.418	1.781 3.164	0.698-4.544 1.014-9.869	0.227 0.047
Type of practice Single-handed	ref		0.438	ref 1.530		0.212	ref		o.736	ref		011.0
Duo practice Group practice	1.504 1.510	0.845-2.678 0.845-2.678	0.165	1.638	0.939-2.491	0.088	0.791 207 0	0.487-1.286	0.345	1.304	0.548-3.103	0.548 0.000
Health centre	1.195	0.584-2.447	0.626		0.748-2.643	0.290	0.769 0.769	0.404-1.464	0.424	1.399	0.507-3.859	0.517
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Table 4. GPs' opinions about the module cardio-metabolic risk. A comparison before and after the introduction of the Prevention Consultation guideline.

This question was not asked in the questionnaire in 2008 ij.

Table 5. GPs' opinions ab Prevention Consultation	out health c guideline, c	care institu ontrolling 1	tions in whi for gender o	ch a cardio Jifferences,	-metabolic age differe	check can ences and (be perform differences	in type of p	arison befo ractice, a r	ore and afte nultivariabl	er the introc e logistic re	uction of the gression.
A cardio-metabolic	Municipal	Health Se	rvices	Hospital			Diagnost	tic centre/GI	os lab	Occupati	onal Health	Service
check may also be	(n=551)			(n=555)			(n=556)			(n=553)		
performed at/in the												
	Odds ratio	95% C.I.	Ь	Odds ratio	95% C.I.	Ь	Odds ratio	95% C.I.	Ь	Odds ratio	95% C.I.	ď
Cohort (2013, ref 2008)	1.437	1.000-2.067	0.050	1.922	1.329-2.781	0.001	1.614	1.125-2.316	600.0	2.227	1.533-3.236	0.000
Gender (female, ref male)	0.894	0.598-1.335	0.582	0.844	0.561-1.270	0.417	0.905	0.608-1.346	0.622	1.166	o.773-1.759	0.463
Age <40 vears old	ref		0.551	ref		0.740	ref		0.017	ref		0.359
40-49 years old	1.064	0.637-1.778	0.811	0.919	0.558-1.513	0.001	1.306	0.792-2.153	0.259	1.308	0.769-2.222	0.322
50-59 years old	0.927	0.554-1.551	0.772	0.407	0.242-0.685	o.363	0.704	0.422-1.175	0.179	1.147	0.671-1.960	0.616
>60 years old	1.462	0.706-3.030	o.306	0.712	0.343-1.481	0.452	1.453	0.702-3.006	0.314	1.882	o.886-3.996	0.100
Type of practice			0.244			0.107			0.781			0.932
Single-handed	ref			ref			ref			ref		
Duo practice	0.721	0.449-1.157	0.175	o.673	0.416-1.089	0.489	o.786	0.493-1.253	0.312	1.025	0.628-1.674	0.922
Group practice	0.934	0.583-1.494	o.774	0.845	0.525-1.361	o.563	0.852	0.533-1.362	0.503	1.124	0.688-1.837	0.640
Health centre	1.272	0.709-2.279	0.420	0.836	0.456-1.533	o.593	0.827	0.454-1.505	0.534	o.933	0.497-1.750	0.829

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Gender differences

Significantly less female GPs than male GPs reported to actively invite patients for preventive measurements (OR = 0.646, p=0.044) (table 3). No gender differences were found regarding both strategies of active working methods (p=0.290). No significant moderating effects of gender on the effect of the introduction of the Prevention Consultation guideline were found, except for the opinion "A cardio-metabolic check may be performed at a diagnostic centre/GPs lab" (p=0.013). Subgroup analyses showed that the odds ratio between the 2013 and the 2008 cohort to agree to this opinion for males (OR=1.132, Cl(0.681-1.882)) is smaller than the odds ratio for females (OR=2.557, Cl(1.482-4.413)), indicating that the introduction of the Prevention Consultation guideline changed female GPs' opinion more towards a diagnostic centre/GPs lab being a suitable place to perform a cardio-metabolic check.

Facilitators of selective prevention of cardio-metabolic diseases

Both financial compensation for the extra time and effort spent (90%) and financial support to offer a practice nurse more working time (92%) were mentioned as facilitating factors to spend more time on selective prevention of cardio-metabolic diseases. Slightly even more GPs (95%) mentioned scientific evidence about the effectiveness of selective prevention as a facilitating factor. Seventythree percent would be inclined to carry out selective prevention if it will cost them little extra effort.

Discussion

Main results and interpretation

We aimed to study how attitudes and working methods of Dutch GPs in selective prevention of cardio-metabolic diseases changed after the introduction of the module cardio-metabolic risk of the guideline Prevention Consultation in 2011. Although both in 2008 and in 2013 the majority of the GPs reported it is worthwhile to detect patients at increased risk for cardio-metabolic diseases, this number significantly decreased and less GPs indicated that a module cardio-metabolic risk is useful after the introduction of the module. We found that more GPs actively approached patients for preventive actions of cardio-metabolic diseases after the introduction of the module cardio-metabolic risk. We cannot conclude that the introduction of the module was the only cause of this change in working methods, because this change can as well be caused by other factors than the introduction of the module cardio-metabolic risk, e.g. the increased availability of practice nurses in general practice in the Netherlands, and the increasing interest in prevention in politics and society. Moreover, even though an active approach of patients with an unknown risk for cardio-metabolic

diseases increased, preventive measurements are both in 2008 and in 2013 most frequently performed when patients explicitly ask for it or when patients already have known risk factors for cardio-metabolic diseases.

Although in 2013 the majority of the GPs still is positive about the module cardio-metabolic risk, only 30% of the respondents have fully implemented this module in their practice. This relatively low number could be explained by the extra workload and costs this module brings along with, but also by the question whether scientific evidence of the effectiveness of the module is sufficient, especially as we found that less GPs indicated that a module cardio-metabolic risk is useful after the introduction of the module. An explanation for this decrease could be that in 2008 the expectations were high; in 2013 the module was available, and the expectations were not entirely fulfilled. Further research of the effectiveness of the module cardio-metabolic risk in preventing cardio-metabolic diseases in general practice is therefore necessary. It is particularly important that sufficient financial support will come available for the implementation of selective prevention.

Our findings are largely consistent with findings from our previous research in which we concluded that insecurity about reimbursement and lack of scientific evidence were the main barriers for the implementation of prevention programs in general practice.¹⁰ Nevertheless, in that study we hypothesized that the ethical view of GPs that everyone should have the same right to obtain preventive care gradually takes over the inclination to hold on to evidence based prevention. Heavy workload, lack of time and lack of remuneration were also mentioned in other studies as barriers for the implementation of prevention in general practice.^{18,19,20}

GPs consider general practice as the most appropriate setting to carry out preventive measurements. Remarkable however is the finding that GPs nowadays, in contrast to 2008, more often report that a cardio-metabolic check may also be performed in other health institutions. This can be explained by the more firm position of general practice nowadays²¹ and the increasing workload perceived by GPs.¹⁸

We found that more male GPs actively invite patients to visit the practice for preventive measurements, compared to female GPs. We hypothesized that this can be explained by broader focus on finances ²² and organization by male GPs that stimulates them to implement prevention programs in which they actively invite patients. Female GPs have longer patient visits ²³ and compared to male GPs and female GPs are more active in preventive counseling but equal in preventive screening.¹⁴ Less female GPs actively invited patients for preventive measurements in our study. The female GPs seem to compensate for actively inviting patients for prevention with preventive measurements in patients who visit the general practice for other complaints, probably

enabled by the longer visits,^{22,23,24} for no gender differences were found comparing both strategies of active working methods together.

Strength and limitations

The strength of our cross-sectional study is the availability of a representative population of GPs before and after the introduction of the module cardio-metabolic risk. The characteristics of our respondents in 2013 mainly correspond with characteristics of GPs in the Netherlands,¹⁵ except for gender. This difference is deliberately caused by our gender stratified sample. The characteristics of our respondents in 2013 do not correspond with the characteristics of respondents in 2008 regarding age, gender and type of practice. We therefore adjusted for age, gender and type of practice in the comparison of the studies using multivariable logistic regressions.

Both in 2008² and in 2013, the response to the questionnaire was only 30%. We know from previous research that response rates among GPs often are low.^{25,26} Low response rates are not problematic as long as the study population is representative for the entire target population. In our study the study population is representative, as is shown in table 1.

It is possible that GPs with more positive attitudes and working methods towards active prevention strategies in cardio-metabolic diseases and with more interest in selective prevention responded in 2013. This can lead to selection bias. However, we assume that both in 2013 and in 2008 the GPs who responded showed as well more positive attitudes and working methods compared to the non-responders.

Conclusion

Our main conclusion is that in 2013 GPs report more active working methods towards selective prevention of cardio-metabolic diseases, but only 30% fully implemented the module cardio-metabolic risk in their practice. In 2013, less GPs considered the module cardio-metabolic risk as useful as part of the Prevention Consultation. They are more willing to delegate preventive actions to other stakeholders compared to 2008. GPs consider financial compensation for the extra time and effort spent and evidence about the (cost-)effectiveness of selective prevention of cardio-metabolic diseases as important facilitators for implementation. More male GPs than female GPs actively invite patients to visit the practice for preventive measurements. No gender differences were found comparing both strategies of active working methods together.

Further research is necessary to study whether the module cardio-metabolic risk will lead to a decrease of the number of patients with cardio-metabolic diseases, whether the module cardio-

metabolic risk of the Prevention Consultation guideline in particular is useful, whether selective prevention of cardio-metabolic diseases in general practice is cost-effective, and whether GPgender is a factor to take into account when implementing a prevention program. Political choices have to be made in order to financially facilitate selective prevention in general practice.

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Preventative health programs aimed at young women: do not focus on self-rated health

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Submitted

Abstract

Introduction: Lifestyle is established early in life and sets the pattern for later years. Knowledge on risk behaviour among young women, and the relation between risk behaviour and self-rated health (SRH) contributes to focus prevention efforts.

Materials and methods: Health interview data originate from the second Dutch National Survey of General Practice. 64,5% responded.

Results: We included data of 297 women aged 18 to 23. 84% visited her general practitioner in the past year. Thirteen percent rated her health as fair or poor. 34% smoked. Six percent reported alcohol abuse, seven percent used soft drugs. 35% reported insufficient physical exercise. Only smoking had a significantly negative effect on SRH, but adjusted for other risk factors no single risk factor had a significant effect on SRH. Clustering of risk factors was related to a lower SRH. **Discussion:** An unhealthy lifestyle was common in young women. Risk behaviour had no effect on SRH, apart from smoking and clustering of risk factors. Preventative health programs aimed at young women must not focus on current SRH but on future consequences of their lifestyle. Because of the high consultation frequency of young women the GP plays an indispensable, challenging key role in prevention.

Key words Young women, lifestyle, self-rated health, multiple risk behavior, women's health, prevention.

Introduction

Young women are at high risk of an unhealthy lifestyle. Lifestyle is established early in life, setting the pattern for later years.¹ Therefore early intervention of lifestyle and prevention of lifestyle related diseases is necessary. Young people show a pervasive phenomenon called unrealistic optimism when evaluating their risk of harm,² which makes it very difficult to intervene. In the last decade the number of smoking young women is increasing and the number of young women exerting physical exercise is decreasing.^{1,3} Research also reveals that young women have a lower dietary fibre and fruit intake than young males.^{1,4,5} Once considered to be predominantly male problems, smoking and binge drinking (consuming five or more alcoholic drinks on one occasion) have become serious health-risk problems among female adolescents and young women. The introduction of ready to drinks caused even more heavy drinking patterns especially among young women.⁵ More than one-quarter of the females in high school and college is a current smoker, and one quarter to one-third is a binge drinker.^{6,7} Smoking, alcohol intake, diet and physical exercise represent key aspects of lifestyle that influence the risk for the major diseases of affluent societies such as coronary heart disease, obesity, diabetes mellitus and cancer. Early onset of drinking alcohol is related to the use of alcohol in adulthood.⁸ The increasing rates of smoking and alcohol use among females are also worrisome because of the greater vulnerability of females than males to many of the adverse health effects of tobacco and alcohol use.⁶

Young women are additionally at high risk of weight gain, of becoming obese and of developing obesity-related conditions over time. Physical inactivity and poor diet are the two major risk factors, occurring more frequently in young women than in men. Obesity affects young women's life satisfaction and their future aspirations.^{9,10,11,12,13} A higher body mass index (BMI) is associated with lower scores for general health and vitality sub-scales on the SF-36, with cardiovascular disease and with cancer mortality.^{14,15,16,17} Furthermore, obesity in women is associated with several reproductive disturbances.²⁸

A different health problem in women at higher age is osteoporosis. Women with low calcium intake during childhood and adolescence have less bone mass in adulthood and are at greater risk of osteoporotic fractures. Gain in bone mass occurs in healthy young women before the age of thirty. Physical activity and sufficient calcium intake both exert a positive effect on this bone gain. Increases in physical activity and calcium intake may significantly reduce the risk of osteoporosis later in life.^{19,20,21,22}

Based on the assumption that adolescence and health are synonymous, the health of young people tends to be ignored. Female adolescents report more health problems and health complaints, and higher rates of chronic illness and psychological disturbance than male

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adolescents.²³ Young women are at risk of future health problems because of a current unhealthy lifestyle. And they appear to be more vulnerable than males to many of the adverse health effects of tobacco and alcohol use.

Interventions aimed at improving lifestyle usually focus on health and expected health benefits. If there is no relation between unhealthy lifestyle and self-rated health (SRH), prevention programs that aim at enhancing motivation by focusing on the relation between unhealthy lifestyle and SRH have no effect.

Emphasis on the (future) health of young women is necessary now we know that they are catching up with the boys in terms of health risks^{1,6,22} Furthermore, it is essential to study the effect of multiple risk factors, because health behaviour affecting risk for lifestyle diseases tends to cluster. We couldn't find research on the relationship between (multiple) risk behaviour and the SRH of young women. Therefore the questions we need to answer are: how do young women rate their health? Secondly, is (multiple) risk behaviour related to their SRH? Thirdly, how can young women be reached to deliver preventive activities to enhance a healthy lifestyle? And lastly, can the general practitioner as family doctor play a role in these preventive services?

Materials and methods

The data used in this study originate from the Second Dutch National Survey of General Practice (DNSGP-2) of NIVEL (Netherlands Institute for Health Services Research), which has been carried out in cooperation with the National Information Network of General Practice (NIN-GP).²⁴ The DNSGP-2 was carried out with the aim of providing information for researchers and policy makers about the role of general practice in the Dutch health care system. Data were collected between April 2000 and January 2002. The study was carried out in 104 general practices in the Netherlands, comprising 195 GPs (in total 165 GP full-time equivalents). The listed patients in these practices (N=385,461) form a representative sample of the Dutch population. An all-age random sample of approximately five percent of the Dutch-speaking listed patients was asked to participate in a health interview survey (N=19,685); 12,699 responded (64.5%). The 90 minute interviews were carried out over one year, with a random fourth part per successive quarter of the year, to avoid seasonal patterns. From the 12,699 respondents 297 were females between 18 and 23 years old.

Self-rated health

SRH was operationalized as the score on the general perceptions scale of the SF-36. The question asked was: In general, would you say your health is: (1) excellent, (2) very good, (3) good, (4) fair or

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(5) poor. The five categories were dichotomised into excellent and (very) good versus fair and poor.^{25,26} Previously, a Dutch version was validated.²⁷

Self reported health problems

The self reported health problems were operationalized as (1) self reported chronic conditions, (2) acute symptoms, and (3) acute illnesses. Participants in the health interview indicated whether they suffered from one or more chronic conditions (from a fixed list) in the twelve months preceding the interview. The list of conditions was developed under the auspices of Statistics Netherlands and has been regularly applied in health surveys in the Netherlands in the last decades.²⁴ The fixed list of acute symptoms and acute illnesses was also developed under the auspices of Statistics Netherlands. Participants indicated for every symptom whether they suffered from it during the two weeks preceding the interview. For every illness they indicated whether they suffered from it during the previous two months.²⁴

Body mass index (BMI) was based on self reported length and weight: underweight is defined as BMI <18.5, overweight when BMI equals or exceeds 25.

Use of GP-service: we measured the consultation frequency of the GP. The respondents were asked whether they visited their GP in the previous twelve months.

Risk factors

Smoking: we made a distinction between current smokers and current non-smokers. Smokers were asked at what age they started smoking.

Consumption of alcohol: the age at first use and the average number of units per week were determined based on participants' responses. Excessive alcohol consumption for women was defined as consuming more than 14 alcoholic consumptions per week. Alcohol abuse is defined as two or more positive items on the CAGE test (range o-4).^{28,29}

Nutrition: When exemplifying the eating habits in the results we included skipping a meal as a risk factor. $^{\rm 30}$

(Illicit) drug use: respondents have been inquired about their current use of soft drugs (cannabis) and/or hard drugs (heroin, cocaine, mushrooms, amphetamine or XTC) for two months or more.

Osteoporosis: The consumption of calcium was measured by determining the consumption of milk, yoghurt, and cheese. Insufficient calcium intake was defined as no consumption of milk and yoghurt at all and less than one slice of cheese per day.

Physical activity: physical activity was assessed by using the Short Questionnaire to Assess Health-enhancing physical activity (SQUASH). The reliability and validity of this questionnaire was established earlier .³¹ Distinction was made between insufficient physical activity (less than 5 days

per week a minimum of 30 minutes of moderate activity), and sufficient physical activity. For reasons of efficiency the SQUASH was only applied in a random 50% of the respondents.

Analyses

Statistical analysis was performed with SPSS statistical software for Windows. Descriptive statistics (percentages) were used to describe the study population. The relationship between multiple risk factors (smoking, excessive use of alcohol/alcohol abuse, use of drugs, insufficient physical activity and < 3 meals per day) and SRH was tested using multivariate logistic regression analyses, using the dichotomized SRH as the dependent variable. Chi-square tests were applied to test the influence of the number of risk factors on SRH, dichotomised into excellent and (very) good versus fair and poor. Odds ratios and 95% confidence intervals were calculated to determine whether risk factors influence the SRH when adjusted for other risk factors.

Results

Data of 297 women aged 18 to 23 were included. Their mean age was 20 years (SD=1.4) (table 1).

	n (% of total)
Age in years:	
-18	70 (24)
-19	71 (24)
-20	65 (22)
-21	42 (14)
-22	49 (17)
Self-rated health:	
-excellent	42 (14)
-very good	95 (32)
-good	121 (41)
-fair	36 (12)
-poor	3 (1)
Risk factors:	
-Smoking	102 (34)
-Excessive use of alcohol/alcohol abuse	17 (6)
-Use of illicit drugs	20 (7)
-Insufficient physical activity	43 (35)*
-< 3 meals per day	120 (40)
Body Mass Index:	
-Underweight (<18.5 kg/m2)	33 (12)
-Normal weight (18.5-24.9 kg/m2)	217 (76)
-Overweight (≥25 kg/m2)	37 (13)
Number of risk factors**	
- none	31 (26)
- 1	39 (32)
- 2	40 (33)
- 3 or more	11 (9)

Table 1 - Characteristics of the study	v population.	females aged 18-23	in percentages (n=297)
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* n=123

Self-rated health

Thirteen percent rated her health as fair or poor. Headache and tiredness were the most commonly reported acute symptoms. Sixty percent of the women reported that they suffered from these symptoms in the past two weeks. Most of the common acute symptoms can be categorised under 'vague symptoms' such as headache, tiredness, sleeplessness, lower back pain, neck and shoulder pain, abdominal pain or cramps, agitation, diminished interest or pleasure, nervousness and
dizziness. The prevalence of these symptoms varied from fifteen percent (diminished interest or pleasure) to sixty percent (both tiredness and headaches) (table 2). Thirty-six percent of the young women suffered from four or more of these vague symptoms. Only fourteen percent suffered from none of these symptoms. A minority (five percent) reported no symptom at all in the past two weeks. As for the chronic conditions, almost a quarter of the respondents (24%) suffered chronically from migraine or headache. Eighteen percent was impaired by anxiety. Almost one in three women reported feelings of depression, anxiousness or concern for two weeks or more in the past. More than fifty percent of them reported this over the past twelve months. Thirteen percent was overweight and twelve percent was underweight. In the year prior to the interview 84% of the young women visited her general practitioner.

Symptom	n (% of total)
Headache	177 (59.6)
Tiredness	177 (59.6)
Sleeplessness	88 (29.6)
Neck and shoulder pain	78 (26.3)
Abdominal pain or cramps	73 (24.6)
Nervousness	72 (24.2)
Dizziness	63 (21.2)
Lower back pain	61 (20.5)
Aggressive feelings, easily irritated	59 (19.9)
Diminished interest or pleasure	43 (14.5)
Agitation	24 (8.1)
Constipation	17 (5.7)

Table 2: Preval	lence of 'vague	symptoms',	females aged:	18-23 (n=297)
		/		

Risk factors

More than one third of the young women smoked (34%) and 45% of them were fourteen years or younger when they smoked for the first time. Eighty-two percent of the respondents drank alcohol. More than half of them (55%) drank their first alcoholic consumption before the age of sixteen. The average number of alcoholic consumptions was on a weekday slightly more than one (1.1) and during the weekend almost five (4.7). Six percent of the women drank more than fourteen alcoholic consumptions per week. Fifteen women (six percent) scored two or more positive answers on the CAGE questionnaire indicating alcohol abuse. Seven percent of the women recently used soft drugs for more than two months. Fifteen percent had been using soft drugs for more than two months in

the past, but not at the time of the survey. Hard drugs were not used by anyone, but were used in the past for a period more than two months by five percent. More than one third (35%) of the young women reported insufficient physical exercise. One percent had both inadequate calcium intake and physical exercise. Forty percent of the young women skipped a meal daily.

Multiple risk factors

In one out of four women (26%) none of the above described risk factors was present. The remaining 74% was divided in 39 (32%) with one risk factor, forty (33%) with two risk factors and eleven (nine percent) with three or more risk factors (table 1).

Relation between self-rated health and risk factors

Only smoking had a significantly negative influence on SRH (p=0.006) although insufficient physical exercise, illicit drug use and less than three meals a day at least suggest a negative effect on SRH (table 3). When adjusted for other risk factors no single risk factor had any influence that appeared to be significant (table 4). The more risk factors, the larger the chance to rate one's health as fair or poor (p=0.004) (Figure 1).

Risk factor	% self-rated health	Р	n (% of	
	Risk factor absent	Risk factor present		total)
Smoking	9	21	0.006	102 (34)
Excessive use of alcohol	13	12	0.851	17 (6)
Use of illicit drugs	12	25	0.104	20 (7)
Insufficient physical activity*	6	16	0.074	43 (35)
< 3 meals per day	10	17	0.066	120 (40)

Table 3: Relation between risk factors and self-rated health rated as fair/poor, females aged18-23 (n=297)

* n=123

Table 4: Relation between risk factors and health rated as fair/poor, females aged 18-23 adjusted for the presence of other risk factors. (n=297) +

(multivariate analyses)

Risk factor	Odds ratio	95% confidence interval	n (% of total)
Smoking	3.263	0.9–12.4	102 (34)
Excessive use of alcohol	4.005	0.5-31.2	17 (6)
Use of illicit drugs	0.571	0.0-8.4	20 (7)
Insufficient physical activity*	2.862	0.8-10.4	43 (35)
< 3 meals per day	3.135	0.8–12.9	120 (40)

* n=123

Figure 1: Relation between the number of risk factors and self-rated health, females aged 18-



23 (n=121) (chi-square)

p=0.004

Discussion

Adjusted for the presence of other risk factors we discovered no significant correlation between the risk factors and the SRH of young women. This is a serious matter, considering that many young women are leading an unhealthy lifestyle. 34% smoked, six percent had developed an alcohol dependency, seven percent used drugs and 35% had insufficient physical exercise. 74% of the young women had one or more of these risk factors. All these risk factors can contribute to future health symptoms. Thirteen percent rated her health as fair or poor and only five percent didn't report any

medical symptom in the past two weeks. More than eight out of ten young women visited her GP in the past twelve months.

What we did find in our study is that smoking had a negative effect on the SRH, and insufficient physical exercise, illicit drug use and skipping a meal suggested a negative effect on the SRH as well. Only excessive use of alcohol didn't seem to influence the SRH at all. But adjusted for the presence of other risk factors no significant correlation was found between SRH and risk behaviour.

45% of the young women started drinking alcohol before the age of 16, which is a risk factor for heavy drinking in adulthood.⁸ In our study we found that young women ran a higher risk to rate their health as fair or poor when their unhealthy behaviours cluster. There is evidence that unhealthy behaviours are interrelated. Smoking, drinking alcohol to excess, skipping a meal and physical inactivity cluster among young women. Among females a greater proportion of smokers doesn't eat breakfast^{4,6,22,32,33} In the Australian Longitudinal Study on Women's Health researchers found a strong association between smoking, heavy drinking and drug use in young women.^{7,34} We found that, unless their risk factors cluster, young women did not clearly rate their health as fair or poor during early adulthood. But still they are exposing themselves to detrimental effects increasing their risk for future cardiovascular disease, diabetes mellitus, cancer, obesity, infertility, addictions and osteoporosis. This outcome is partly in contrast with other studies where substance use by adolescents was associated with reduced life satisfaction and a lower rated quality of life. Topolski et al. and Zullig et al. found that adolescents who engaged in at least one health risk behaviour perceived a lower quality of life.^{35,36} We found that smoking, insufficient exercise and skipping a meal had a negative effect on the SRH when corrected for other risk factors, but we couldn't prove this in our statistical analysis. Like us, Topolski et al. found that the more multiple risk behaviours were found, the lower the quality of life was perceived.³⁵ The conclusion drawn from these studies is that there is need to further assess whether dissatisfaction with life is a consequence or determinant of substance abuse behaviour in adolescence.^{35,36} The differences with our outcomes concerning the single risk-behaviour may be explained by the fact that we only studied young women.

Consequences of our findings are that when an unhealthy lifestyle hardly effects the SRH, and only significantly lowers the SRH when it's plural, the perceived vulnerability to a threatened event, e.g. a cardiovascular disease or osteoporotic fracture might be absent. Greening et al. argued that the lack of experience with, and not worrying about serious health consequences may desensitize adolescents to potential health risks, and stated that young people show a pervasive phenomenon called unrealistic optimism when evaluating their risk of harm.² For instance: many young women believe that they are unlikely to develop osteoporosis.^{37,38,39} This demonstrates that prevention is not on their mind whereas we found in our study that 35% of the young women was

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running an elevated risk for osteoporosis based on their lifestyle. Whether the risk for a future disease as a result of a current unhealthy lifestyle is even an issue for these young women seems to be unknown.

Limitations of this study include the size of the group. Especially the number of participants questioned about physical exercise is only a random 50% of the respondents. This was done for reasons of efficiency. Nevertheless, because we randomly collected data in populations listed in general practices, we reached a high response. Therefore it is a representative study in a for scientific research less accessible group. Secondly, the risk behaviour is self-reported. This means that the actual numbers might be higher, which is plausible and very likely the case, given the fact that people are prone to give socially acceptable responses when asked about lifestyle factors. The last limitation is the difficulty to determine the socio economical status. In the DNSGP-2 this was measured by the highest educational attainment. In this age group the eventual educational attainment is probably not yet achieved. This is the main reason why we didn't adjust our data for the SES.

The preventative role of the GP can be of great importance because of the high consultation frequency. Taken into account that 84% of the young women visited her GP in the year prior to the interview the GP plays an indispensable and challenging key role in prevention. Because of the high consultation frequency of young women this frequent contact with the family doctor should be included in the research for preventive activities.

Conclusion

We had the ambition to acquire knowledge about the SRH of young women. This study supports the finding that young women do not rate their health as good as one might think based on the prevailing image of healthy and successful young women. Many of the young women reported health symptoms and a substantial number rated their health as fair or poor, and many of them had an unhealthy lifestyle with one of more risk factors. Their lifestyle and risk behaviour had little effect on the current SRH. And when it effected the health perception this only occurred when unhealthy risk factors clustered. The youth of today is the generation of morbid elderly of the future. Therefore, we have to find out how to influence the risky lifestyle of young women. Focusing on SRH of young women is of no use, as is apparent in our study. More consideration should be given to the knowledge of young women about the risks they are running. More awareness for future health problems for instance at school or by their GP, and also involving the parents or caretakers, is

essential. Studies are needed to observe the health effects of increasing knowledge and awareness among these young women.

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Prevention of coronary heart disease and osteoporosis in women aged 45-49: a challenging role for general practitioners

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Abstract

Objective: Part of the risks for coronary heart disease (CHD) and osteoporosis in women are established by their lifestyle in the premenopausal period. Therefore, we assessed the risk of women aged 45 to 49 years for CHD and osteoporosis and its relation with socioeconomic status (SES) and the access to general practitioners (GPs) to provide clues for prevention.

Methods : The health interview data used for this study originated from the second Dutch National Survey of General Practice, a study with a response rate of 64.5%. We studied SES, risk factors for CHD and osteoporosis and access to GPs in women aged 45 to 49 years.

Results: Data of 571 women aged 45 to 49 years were included. A total of 39% had an increased risk for developing CHD in the next 10 years, and 3% had a high risk. A total of 22% had an increased risk for osteoporosis. We found a significant relation between SES and unhealthy lifestyle. An unhealthy lifestyle led to an increased or high risk for CHD, and a high osteoporosis risk. We did not find a significant relation between SES and GP consultation frequency.

Conclusions: Special attention is required for women with the lowest SES because they have an unhealthier lifestyle than do women with middle or the highest SES. The group of women at higher risk for CHD and osteoporosis consulted their GP in the same frequency as did women at lower risk. The Dutch GP seems to be in an ideal position to play a role in the prevention of CHD and osteoporosis in premenopausal women because access to GPs is not influenced by SES.

Key words Coronary heart disease, osteoporosis, socioeconomic status, prevention, lifestyle, general practitioner

Introduction

The risks for coronary heart disease (CHD) and osteoporosis in premenopausal women are underestimated because of the perception that women are "protected" against ischemic heart disease and osteoporosis by their hormonal status. However, part of the risks for CHD and osteoporosis in postmenopausal women is established by their lifestyle in the premenopausal period.²⁻³ Most women do not perceive that heart disease is a substantial health concern and are not well informed about their risk.⁴ Knowledge about and awareness and perception of susceptibility to osteoporosis are limited and even more limited in women with low educational attainment.⁵⁻⁷ For instance, perimenopausal women smokers are more aware of their increased risk for developing lung cancer than their increased risk for developing heart disease or osteoporosis.⁸

Misconception of actual risks influences attentiveness to risk reduction or disease prevention messages and, consequently, knowledge and behavior. Even though CHD is still portrayed as a typical men's disease, it is the leading cause of death among women.⁹ The incidence of myocardial infarction and angina pectoris increases with age in both sexes. With advancing age, the incidence of events in women approaches the incidence seen in men.¹⁰ Apart from a genetic predisposition, an unhealthy lifestyle contributes to increasing the risk for CHD.¹¹

In the Minnesota Heart Study, Luepker et al²² found that CHD and its risk are more frequent among those of lower socioeconomic status (SES). Education is significantly and inversely related to blood pressure, smoking, and body mass index (BMI) for both men and women. Once confronted with CHD, SES influences the referral pattern: women with low SES were referred to cardiologists significantly less than men were.⁹

Osteoporosis is largely preventable by optimizing peak bone mass in younger years, maintaining bone mass in adult years, and minimizing bone loss in later years.¹³ Weight-bearing physical activity and adequate intakes of calcium are effective throughout life.¹⁴ Unhealthy behavior such as cigarette smoking and excessive alcohol intake induces bone loss.¹⁵⁻¹⁸ Epidemiological research shows that postmenopausal women have the highest incidence of osteoporosis.^{13,14} In the National Health and Nutrition Examination Survey (NHANES) III study, Wang and Dixon¹⁹ highlight important socioeconomic differences in bone mineral density.

Healthcare providers like general practitioners (GPs) are important target professionals for lifestyle-related diseaseprevention messages and strategies focused on women. Most women feel comfortable talking to their GP about preventive health options.4 Management of lifestyle and risk factors depends partly on adequate access to health care. The Dutch GP has a central position in health care as gatekeeper.

When we get more insight into the health behavior of women aged 45 to 49 years and their use of GP service, we can find a way to motivate them to adjust their lifestyle. Besides, we must find out how GPs can play a role in the prevention of CHD and osteoporosis in women, especially in the light of increasing health problems in their near future. Therefore, we need to know the frequency of GP consultation among these women. We formulated the following questions: what is the risk for two main lifestyle-related problems, CHD and osteoporosis, in women aged 45 to 49 years? What is the relation between these lifestyle-related problems and SES? And what is the use of GP care among these women? We selected this age group because these women are predominantly premenopausal. This means that prevention can take place before the actual disease reveals itself. Moreover, in this premenopausal period, we expected less interference from climacteric symptoms.

Methods

Health interview data for this study originated from the second Dutch National Survey of General Practice (DNSGP-2).²⁰ The DNSGP-2 was carried out with the aim of providing actual information for researchers and policy makers about the role of general practice in the Dutch healthcare system. Data were collected between April 2000 and January 2002. The study was carried out in 104 general practices in the Netherlands, comprising 195 GPs (in total, 164.75 GP fulltime equivalents). For the Health Interview Survey, an all-age random sample of 19,685 participants (approximately 5% of the patients listed in the participating practices) was drawn. The distribution of age, sex, and place of residence of the 12,699 (64.5%) respondents was comparable with that of the sampled population.20 Interviewers were trained for the computer-assisted personal interview. The duration of the interview was, on average, 90 minutes, and it took place at the respondent's home. The interview included mostly validated instruments to establish sociodemographic status, health status, healthcare utilization, and their determinants. The interviews were carried out over 1 year, with a random fourth part per successive quarter of the year, to avoid seasonal patterns. From the 12,699 respondents, 571 were women between 45 and 49 years old. From the interviews, the following data were used for this study.

Risk factors

Smoking: a distinction was made between current smokers and current nonsmokers. Smokers were asked at what age they started smoking.

Alcohol abuse: alcohol abuse is defined as two or more positive items on the CAGE test (range, o-4).^{21,22}

Physical activity: physical activity was assessed by using the Short Questionnaire to Assess Health-Enhancing Physical Activity. The reliability and validity of this questionnaire have been established before.²³ Distinction was made between insufficient physical activity (<5 d/wk, a minimum of 30 min of moderate activity) and sufficient physical activity. For reasons of efficiency, the Short Questionnaire to Assess Health-Enhancing Physical Activity was applied only in a random 50% of the respondents (235 women).

BMI: BMI was based on self-reported height and weight: underweight is defined as having a BMI less than 18.5 kg/m²; overweight as BMI equaling or exceeding 25 kg/m²; and obesity as BMI exceeding 30 kg/m².

Insufficient calcium intake: insufficient calcium intake was determined by self-reported no consumption of milk and yogurt at all and less than one slice of cheese per day. For reasons of efficiency, the dietary questionnaire was applied only in a random 50% of the respondents (278 women).

Unhealthy lifestyle: this includes smoking, alcohol abuse, insufficient physical activity, insufficient calcium intake, or being overweight.

Risk for CHD: to predict the risk for CHD, we used the Framingham Risk Prediction Score.²⁴ This algorithm provides an estimation of the total CHD risk (risk of developing one of the following: angina pectoris, myocardial infarction, or death from coronary disease) in the course of 10 years and originally includes age, cholesterol, blood pressure, diabetes mellitus, and smoking. We included age, the presence of hypertension (derived from the electronic medical record of the respondents), smoking, and diabetes mellitus (derived from the electronic medical record of the respondents). This score is applicable only in persons without known heart disease, so we excluded the women with known CHDs. This information was derived from the electronic medical record of the respondents. We adjusted the score because of the absence of data on cholesterol levels in our study. Three categories were defined based on the adjusted Framingham risk scores and reference values: low (for women aged 45-49 y, a 3% risk for CHD in the next 10 years is deemed low risk),²⁴ intermediate (between the low risk and average risk of >3% and ≤5%, respectively), and high (above the average risk of >5%).

Osteoporosis risk: an increased osteoporosis risk was defined by insufficient physical activity or insufficient calcium intake.

Use of GP service: we measured the consultation frequency of the GP and the number of prescriptions by the GP. These data were derived from the electronic medical record of the respondents issued in 1 year.

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Socioeconomic status

For SES, we used the highest accomplished educational level as proxy measure, divided into three groups: lowest (none or primary education), middle (lower secondary professional education), and highest (higher professional education and university) educational level.²⁵

Analyses

Statistical analysis was performed with SPSS statistical software for Windows. Descriptive statistics (percentages) were calculated to describe the study population. W2 analysis was performed to test the influence of SES on unhealthy lifestyle and on the risk for osteoporosis and CHD, as well as the relation between SES and use of GP service.

Results

The data of 571 women aged 45 to 49 years were included. The respondents were equally divided among these 5 years of age. Table 1 gives the characteristics of the women in the study.

	% (N=571)
Age in years:	
- 45	21
- 46	20
- 47	21
- 48	18
- 49	21
Socioeconomic status	
- Lowest educational level	10
- Middle educational level	66
- Highest educational level	24
Use of GP-service	
- At least one visit in the year prior to the interview	83
- Medication prescribed to	78

Table 1: Characteristics of the population, females aged 45-49 in percentages (N=571)

Risk factors for CHD and osteoporosis

More than one third (37%) of the women smoked; 95% of them were younger than 20 years when they started smoking. More than 1 (11%) in 10 women reported alcohol abuse. Also, one (21%) in five women reported insufficient physical exercise; 40% were overweight (BMI >25 kg/m²; Table 2) and 11% were obese (BMI >30 kg/m²). A total of 11% reported hypertension and 2% reported diabetes. The prevalence of an intermediate risk (between 3% and 5%) for CHD in the next 10 years

was 39%. Of the respondents, 22% did not have sufficient physical exercise or sufficient calcium intake. This group had an increased risk for osteoporosis (Figure 1).

Table 2: Unhealthy lifestyle

	% (N=571)
- Smoking	37
- Alcohol abuse	11
- Insufficient physical activity	21*
- Overweight (BMI >25 km/m2)	40
- Insufficient calcium intake	0,3**

* n=235

** n=287



Figure 1: Risk for CHD (N=571) respectively osteoporosis

SES and risks

SES and risk factors for an unhealthy lifestyle were interrelated (P = 0.016). In 40% of the women with the highest SES, we found no risk factor. SES and the risk for CHD were interrelated: the lower the SES, the higher the risk for CHD (P = 0.04). SES and the risk for osteoporosis were interrelated as well. A high osteoporosis risk was associated with low SES (P = 0.04; Figures 2 and 3).





Figure 3: Relation between SES and risk for osteoporosis (N=231), Chi-square p=0.004



Use of GP care and access to the GP

We did not find a significant association between SES and GP consultation frequency. To determine the use of GP service, we found that the prescription rate of women with low SES was higher compared with that of women with middle or higher SES (P = 0.05). More than 80% of the women reported at least one visit to her GP in the year before the interview.

Discussion

Summary of main findings

Our findings demonstrate the high prevalence of unhealthy lifestyle among a population of middleaged, predominantly premenopausal Dutch women. Many had an unhealthy lifestyle and had an increased risk for CHD and osteoporosis. In the presence of a low educational level, this risk behavior increased, increasing the risk for CHD and osteoporosis. We found that SES and an increased risk for CHD were interrelated. These results are in line with conclusions drawn from the Minnesota Heart Survey and the NHANES III study in the United States, ^{12,26} although the age groups were much more extended than ours, 25 to 74 and 25 to 64 years, respectively. The higher risk for CHD can indeed result into a higher morbidity and mortality of CHD,^{9,27} and this higher risk may reveal itself a few years later in the case of the group of women we studied. In the NHANES III study, socioeconomic differences were found in bone health among ethnic groups of postmenopausal women, associated with calcium intake, physical activity, and smoking.¹⁹ The women we studied were younger than the postmenopausal women from the NHANES III study but show the same risk factors associated with low SES leading to a higher risk for osteoporosis. More than 80% of the women reported at least one visit to her GP in the year before the interview. To three of four women, medication was prescribed. We might therefore assume that this group is in the sight of their physician. We found a higher prescription rate in women with low SES. We concluded that the GP use and access to the GP of women with low SES are adequate.

Strengths and limitations of the study

The strength of this study is that we focused on a group of women with good access to GP service, providing us with many data on their health and health behavior. By using a nationwide representative survey (the DNSGP-2), we reached a high response.

Limitations of this study include the definition of an increased osteoporosis risk. There is much evidence that smoking, and even alcohol abuse, increases the risk for osteoporotic fractures.

We defined the risk only by physical activity and calcium intake because we could not find a validated count method or algorithm for reproducing the osteoporosis risk.¹⁵⁻¹⁸ We acknowledge the fact that there are many different ways to determine osteoporosis risk. Nevertheless, in our definition, our study revealed a significant relation between SES and an increased risk for osteoporosis. In other studies, an inverse relationship of osteoporosis and fractures with level of education and lower income was concluded as well^{19,28-30}; therefore, we assumed that by taking insufficient physical exercise and a low calcium intake into account, we identified the women with a higher risk for osteoporosis in our study. It is the challenge of future research to develop a tool for GPs to determine the osteoporosis risk.

Missing data on cholesterol levels were the reason that we were obligated to adjust the Framingham risk score to predict the risk for CHD. This could lead to an underestimation of the risk for CHD. Another limitation is the small group of women with the lowest educational level, who comprised only 10% of the total.

The Framingham risk score seems to underestimate the risk for women with a low and intermediate score. D'Amore and Mora³¹ found that it is important to be aware of the limitations of global estimates of risk such as the Framingham risk score, particularly when asymptomatic women are evaluated. Additional means of assessing risk are useful tools to improve the accuracy of risk assessment, especially in women who are deemed at intermediate risk. A substantial majority of US women (approximately 80%-90%) are deemed at low risk when the Framingham risk scores are applied. This is in contrast to the high lifetime risk for cardiovascular disease, which affects one in two women after the age of 40 years.^{31,32} Among women classified as low risk by the Framingham risk estimation, a third had significant subclinical atherosclerosis.³³ We assume that in reality, the numbers of women at intermediate risk are higher than the numbers we found.

Lastly, we made use of some data that were self-reported, like smoking habits, alcohol abuse, and physical exercise. This could lead to an underestimation of the risk behavior.

Implications for clinical practice and future research

We found several areas where middle-aged women could benefit from physician counseling on health behavior. Women consulted their physicians on a regular basis, including women with a lower SES. GPs can use consultations for preventive activities such as referral to a nurse practitioner, a dietician, or programs to motivate physical exercise, like subsidized sporting programs for people with a low income for which GPs can write a prescription for participation and financial compensation. They can also inventory risk behavior in (new) patients and discuss this behavior in the light of their future risk. Special attention is required for women with the lowest SES, because their unhealthier lifestyle is leading to a higher risk for CHD and osteoporosis, and screening

activities in private practices for the "worried well" do not reach these high-risk groups of women of low SES. Interventions by their GP are needed to improve their health. Even though the reason for the women's visit is probably most of the time not their lifestyle and health behavior, GPs should be more alert regarding the health risks they are running because it is the GP who reaches these highrisk groups, and with relatively minor effort, preventive actions can take place in the GP practice. Future research must focus on preventive efforts, like the implementation of nurse practitioners in GP practices and (subsidized) motivational programs to stimulate and enhance physical activity. Dutch GPs seem to be in an ideal position because access to GPs is not influenced by SES.

Conclusions

In this study, we found a relation between low SES and a substantially increased risk for CHD and osteoporosis in women aged 45 to 49 years. We found that this group of Dutch women of low SES with a higher risk for CHD and osteoporosis consulted their GP in the same frequency as did women with a lower risk for these diseases. The Dutch GP should therefore be a key player in the prevention of CHD and osteoporosis related to an unhealthy lifestyle in premenopausal women.

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Multimorbidity in older women: the negative impact of specific combinations of chronic conditions on self-rated health

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Abstract

Background: Chronic diseases are considered major threats to self-rated health (SRH). In many elderly people multimorbidity is present, in elderly women more than in elderly men. This study aims at establishing the impact of multimorbidity and specific disease combinations on SRH in elderly women.

Objectives: To study the relationship between the number of chronic diseases and SRH and explore possible effects of combinations of chronic conditions on SRH in elderly women. **Methods:** Health interview data used for this study originated from the second Dutch National Survey of General Practice, a study with a response rate of 64.5%. From the 12 699 respondents, 315 were females between 70 and 74 years old.

Results: Of the women, 87% reported one or more chronic condition. Women without any chronic condition rated their health significantly better than those with one or more chronic conditions. Either severe back pain or severe headache was included in return the most prevalent combinations of two chronic conditions with a significantly higher negative impact on SRH than expected.

Conclusion: All combinations including severe headache and some combinations including severe back pain and another chronic condition had a significantly more negative impact on SRH than expected in women aged 70 – 74 years. General practitioners should be alert on severe headache and severe back pain in elderly women to improve proactive the quality of care and thus add to the quality of later years of life.

Key words Elderly women, back pain, headache, self-rated health, multimorbidity.

Introduction

A substantial proportion of the elderly suffers from more than one chronic disease as there is a relation between increasing age and the incidence of multimorbidity.¹ Women suffer from more chronic conditions in old age than men.² Higher prevalence rates of non-fatal disabling conditions contribute substantially more to disability and poor self-rated health (SRH) among aging women compared to aging men.² Not only do women have more disabilities than men, they also have a longer lifespan characterized by a poor SRH.^{3,4}

SRH is widely recognized as a comprehensive indicator of health,^{5,6} and is adversely affected by multimorbidity.⁷ Some chronic conditions are more strongly associated with poor SRH than others, and some combinations of chronic conditions appear to have a more negative impact on SRH than expected.⁷ Gijsen et al., found that comorbid mental disorders were associated with poor SRH.⁸ Other combinations of diseases known to affect inversely SRH are diabetes, cardiovascular disease and/or chronic respiratory disease.^{7,9,10}

In general practice multimorbidity represents the rule rather than the exception among elderly patients.¹¹ In the Netherlands, the general practitioner (GP) has a central position in health care as a gatekeeper to secondary care. General practice is, therefore, an important entrance to the health care system. To offer proactively guidance and treatment, and to improve the quality of care of patients with multimorbidity, GPs need to be aware and must have knowledge of combinations of conditions that negatively affect SRH.

Having a combination of two specific chronic conditions may have more impact than would be expected from having any combination of two or more chronic conditions and demonstrating the effect of multimorbidity is of great importance. The aim of this study was, therefore, to determine whether a significantly higher impact on SRH of specific combinations of chronic conditions was present among most prevalent combinations of chronic conditions in women aged 70 – 74 years in general practice to identify target groups for proactive action and alertness. We also studied the relationship between the number of chronic conditions and SRH.

We selected women aged 70 – 74 years for several reasons. From an anticipating point of view, at this age it is effectively possible to add to the quality of later years of life. Moreover, an older group would contain fewer respondents because of cognitive disability. Lastly, this group is, although mostly retired from work, considered being still active as volunteer, informal caregiver for their partner or baby sitter for their grandchildren and thus contributes largely to our social capital.

Methods

The data used in this study originate from the Second Dutch National Survey of General Practice (DNSGP-2) of the Netherlands Institute for Health Services Research (NIVEL), which has been carried out in cooperation with the National Information Network of General Practice (NIN-GP).¹² The DNSGP-2 was carried out with the aim of providing information for researchers and policy makers about the role of general practice in the Dutch health care system. Data was collected between April 2000 and January 2002. The study was carried out in 104 general practices in the Netherlands, comprising 195 GPs (in total 165 GP full-time equivalents). The listed patients in these practices (*n*=385 461) form a representative sample of the Dutch population. An all-age random sample of approximately five per cent of the Dutch-speaking listed patients was asked to participate in a health interview survey (*n*=19 685); 12 699 responded (64.5%). The 90 min computer assisted interviews were carried out at the homes of the respondents. To avoid seasonal patterns, health interviews were randomly distributed over the year. From the 12 699 respondents, 315 were females between 70 and 74 years old.

Self-rated health

SRH was operationalized as the score on the general perceptions scale of the Short-Form 36. The question asked was: In general, would you say your health is: excellent, very good, good, fair or poor.¹³ The five categories were dichotomized into high SRH (excellent, very good and good health) versus low SRH (fair and poor health). Previously, a Dutch version of the SF-36 was validated.¹⁴

Chronic conditions

Participants in the health interview were asked whether they suffered from one or more chronic conditions from a fixed list in the 12 months prior to the interview. The chronic conditions are self-reported. The list of conditions was developed under the auspices of Statistics Netherlands and has been regularly applied in health surveys in the Netherlands in the past decades.¹²

Multimorbidity

To study the effects of multimorbidity on SRH, we selected the top five of chronic conditions and the most prevalent combinations of two chronic diseases containing at least one of these five most prevalent conditions. Other combinations of chronic conditions not being part of the top five most prevalent combinations, but present in 20 or more women were also studied.

Impact on SRH

To determine the impact of a combination of two chronic conditions on SRH, we compared the SRH of women with a combination of at least two specific chronic conditions of the most prevalent combinations to the SRH of all women with any combination of two or more chronic conditions. For this, we calculated a SRH ratio. The numerator of the ratio is the proportion of the women suffering from two specific chronic conditions and reporting a high SRH. The denominator is the proportion of women suffering from any combination of two or more chronic conditions and reporting a high SRH. If the ratio is statistically significantly lower than 1.0, this indicates a negative effect of the combination of two specific chronic conditions on SRH. We considered a *P* value of less than 0.05 as statistically significant.

Analyses

Statistical analysis was performed with SPSS statistical software for Windows. Descriptive statistics (percentages) were calculated to describe the study population. Stratified cross table analysis was performed to test the relation between SRH and multimorbidity. Chi-square (goodness of fit) testing was used to test for statistical significance. To produce the 95% confidence intervals around the estimates of the SRH-ratio, bootstrap sampling (1000 iterations) and the 95% BCa-intervals were used. This analysis was conducted in R version 2.15.1.

Results

Data of 315 women aged 70 to 74 years were included. The respondents were equally divided among these five years of age. The mean age was 71.9 years (Table 1).

Table I: Characteristics of the population

Characteristics of the population, females aged 70-74 (N=315)

	1	l
Characteristics	Ν	%
Age in years:		
- 70	73	23
- 71	65	21
- 72	53	17
- 73	71	23
- 74	53	17
Self-rated health:		
- excellent	18	6
- very good	44	14
- good	165	52
- fair	77	24
- poor	11	4

Table 2 shows the chronic conditions reported by the participants during the interview. The five most common chronic conditions were osteoarthritis of hip or knee, anxiety, hypertension, depression and urinary incontinence.

Condition	N (%)	N with low SRH (%)
Osteoarthritis of hip or knee	106 (34%)	42 (40%)
Anxiety > two weeks	103 (33%)	37 (36%)
Hypertension	80 (25%)	30 (38%)
Depression > two weeks	64 (20%)	24 (38%)
Urinary incontinence	60 (19%)	26 (43%)
Severe condition of the neck/shoulder	56 (18%)	29 (52%)
Severe back pain	54 (17%)	28 (52%)
Severe condition of elbow/wrist/hand	45 (14%)	21 (47%)
Diabetes mellitus	37 (12%)	17 (46%)
Asthma/copd	37 (12%)	22 (60%)
Migraine or severe headache	36 (11%)	21 (58%)
Cancer	33 (10%)	14 (42%)
Rheumatoid arthritis	27 (9%)	9 (33%)
Dizziness with falling	24 (8%)	14 (58%)
Cerebrovascular incident	23 (7%)	13 (57%)
Severe bowel disorder for >3 months	18 (6%)	8 (44%)
Chronic eczema	17 (5%)	5 (29%)
Other serious heart condition	13 (4%)	6 (46%)
Myocardial infarction	13 (4%)	5 (39%)
Stenosis in aorta or aa. Femorales	13 (4%)	6 (46%)
Psoriasis	6 (2%)	4 (67%)

Table II: Chronic conditions of the population ($n=314$	Table II:	Chronic	conditions	of the	population	(n=315
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Almost nine out of ten women (87%) reported one or more chronic conditions. Almost three quarters of the respondents rated her health as high. Twenty eight per cent rated her health as low. Respondents without any chronic condition significantly more often rated their health as high as those with one or more chronic conditions (*P*=0.024). When the number of chronic conditions increased, more respondents rated their health as low (*P*=0.001) (Figure 1).



Figure 1 - Number of chronic conditions (N) in relation with SRH in women aged 70-74

Number of chronic conditions in relation with SRH in women aged 70-74 (N=315)

P < 0.001

To determine the SRH-ratio the expected proportion of women with a good SRH and two or more chronic conditions was calculated: 122 of the total of 202 women with two or more chronic conditions rated their health as good. The expected proportion was, therefore, 60.4%. Several of the combinations of two chronic conditions that were selected revealed a statistically significant negative impact on the SRH. Significantly negative effects on SRH were seen in the following combinations of chronic conditions: severe back pain and osteoarthritis of hip or knee, SRH-ratio 0.65 (*P*=0.022), severe back pain and depression, SRH-ratio 0.50 (*P*=0.005), migraine/severe headache and urinary incontinence, SRH-ratio 0.35 (*P*=0.003), and migraine/severe headache and anxiety, SRH-ratio 0.58 (*P*=0.020). The combinations of severe back pain and hypertension, SRH-ratio 0.62 (*P*=0.061) and severe back pain and a severe condition of the neck/shoulder, SRH-ratio 0.68 (*P*=0.062) may also be relevant, but failed to reach statistical significance (Table 3). In all combinations of two chronic conditions with a statistically significant negative impact on SRH, either severe headache or severe back pain was present.

Table III: Top five chronic conditions and the most prevalent combinations and combinations present in

more than 20 women

Condition 1	Condition 2	Ν	SRH-Ratio*	Р	95% CI
Osteoarthritis of hip or	Hypertension	28	20/22 0 - 0 87	0 227	0 6202 - 1 1268
knee	riypertension	30	20/23.0 - 0.07	0.327	0.0393 - 1.1300
Osteoarthritis of hip or	Anxiety > two weeks	37	23/22.3 = 1.03	0.827	0.794 - 1.267
knee		57		/	
Osteoarthritis of hip or	Urinary incontinence	33	16/19.9 = 0.80	0.162	0.5522 – 1.0848
Cotecoarthritic of hip or					
knee	Severe back pain	28	11/16.9 = 0.65	0.022	0.3470 - 0.9523
Osteoarthritis of hin or	Severe condition of				
knee	elbow/wrist/hand	28	13/16.9 = 0.77	0.131	0.4621 – 1.0688
	Depression > two				
Anxiety > two weeks	weeks	44	26/26.6 = 0.98	0.859	0.7746 – 1.1856
Anxiety > two	Unartancian	- 9	10/16 0 - 0 77	0.404	0 (950 0 0560
weeks	Hypertension	20	13/10.9 = 0.//	0.131	0.4053 - 1.0503
Anxiety >	Severe condition of	77	12/162 = 0.74	0.000	0.4145 - 1.0102
two weeks	the neck/shoulder	2/	12/10.3 - 0.74	0.090	0.4145 - 1.0102
Anxiety >	Urinary	26	11/15.7 = 0.70	0.059	0.4139 - 1.0176
two weeks	incontinence				
Hypertension	Urinary	27	15/16.3 = 0.92	0.607	0.6266 – 1.2086
<i>,</i> ,	Incontinence	-			
Hypertension	Depression >	18	9/10.9 = 0.83	0.367	0.4244 - 1.1949
	Sovere back				
Hypertension	nain	16	6/9.7 = 0.62	0.061	0.2745 - 1.0929
Depression > two	Osteoarthritis of hip or				
weeks	knee	25	14/15.1 = 0.93	0.653	0.6256 – 1.2210
Depression > two	Severe back		<u></u>		
weeks	pain	20	6/12.1 = 0.50	0.005	0.1978 - 0.8441
Depression > two	Urinany incontinonco	17	0/10 2 - 0.88	0.520	0 (826 - 1 252)
weeks	offinary incontinence	1/	9/10.3 - 0.00	0.529	0.4020 - 1.2534
Urinary incontinence	Migraine/severe	14	3/8.5 = 0.35	0.003	0.1045 - 0.8368
	headache			,	15 5
Osteoarthritis of hip or	Severe condition of	28	13/16.9=0.77	0.131	0.4621 - 1.0688
knee	elbow/wrist/nand			-	
Anxiety > two weeks	Severe condition of	27	12/16.3=0.74	0.090	0.4145 - 1.0102
Sovere condition of	Ostooorthritis of hin or				
the neck/shoulder	knee	26	13/15.7=0.83	0.278	0.5031 - 1.0937
the neeryshoolder	Severe back				
Anxiety > two weeks	pain	25	12/15.1=0.79	0.205	0.4810 – 1.0942
Severe condition of	Severe back		1 66	_	
the neck/shoulder	pain	22	9/13.3=0.68	0.062	0.3289 – 1.0203
Severe condition of	Severe condition of	21	0/12 7-0 71	0.100	0 2021 1 0706
the neck/shoulder	elbow/wrist/hand	21	9/12./=0./1	0.100	0.3931 - 1.0/00
Anxiety > two weeks	Migraine/severe	20	7/12 1=0 58	0.020	0 2225 - 0 0115
Autorety > two weeks	headache	20	//122.1-0.50	5.025	0.2200 0.9115

Discussion

Main results

Most women aged 70 – 74 years reported one or more chronic conditions. The more chronic conditions women suffered from, the lower women rated their health. Although logical and acknowledged,⁷ this confirms the essentiality to take multimorbidity into account in the health management of elderly women. We found that all combinations including severe headache and some combinations including severe back pain and another chronic condition had a significantly more negative impact on SRH. This impact was stronger than can be expected from the impact of two or more chronic conditions on SRH. These conditions are commonly seen in general practice in elderly women, and their presence is largely invisible to the GP due to embarrassment, inconvenience, believing the doctor could not help or acceptation and adaptation by the elderly female patient.¹⁵⁻¹⁷

Interpretation

When possible negative effects of the most prevalent combinations of chronic conditions on SRH were explored, we found that all significant combinations included severe back pain or severe headache. Findings concerning severe back pain were similar to previous studies that concluded that back pain was negatively associated with SRH.^{7,18,19} One study concluded that back pain was one of the most important comorbid conditions affecting SRH,²⁰ but in another study this negative impact of musculoskeletal systems on SRH was not confirmed.⁷ Previous studies focusing on the effect on SRH of comorbidity and headache were not conclusive. Xuan et al., did not find an effect on SRH of the combination of a principal disease and migraine,²⁰ whereas Jensen and Stovner stated in their review that the profound co morbid disorders of severely affected patients with headache complicate their overall outcome.²¹ Wiendels et al. found that high headache frequency and comorbidity contribute to a low guality of live in these patients.²² Whether this is a significantly more negative effect than expected is unknown, because this effect was not compared to other conditions. When studying migraine and co morbidity, Terwindt et al. found that migraineurs are more often depressed than nonmigraineurs, but whether this combination mediated or confounded the SRH ratings of migraineurs went beyond the scope of their study.²³ Lastly, Lipton et al. also found that depression itself reduces SRH in subjects with migraine, but could not fully disentangle the separate and joint influences of migraine and depression.²⁴

Studies to determine effects of multimorbidity and co morbidity on SRH are not new. Earlier research showed a negative effect on quality of life in the combination of chronic respiratory disease, cardiovascular diseases and diabetes.^{7,9,10} In this study was found that combinations with

severe back pain and severe headache, usually considered being less critical, have a significantly negative impact on SRH. Differences in methodology are one of the possible reasons why the results differ from earlier studies. The influence of mostly separate chronic conditions was assessed, whereas others used disease categories ^{7,9,10} or only physical conditions. ¹⁰ By combining individual chronic conditions into groups of diseases, the numbers of respondents per group are larger than in this study, which made it harder to find significant correlations. In this study, as individual subgroups of conditions were sometimes small, not all possible combinations of chronic conditions could be studied. Therefore, we limited ourselves to the most prevalent combinations. A second difference is that only women were studied, and respondents were older: 59.0, 58.5 and 57.6 years old in previous studies ^{7,9,10} versus 71.9 years old in this study. We, therefore conclude, that the influence of multimorbidity on SRH transforms from combinations of mostly fatal to mostly non-fatal, but disabling diseases as women grow older. Women who have reached the age of 70 – 74 have survived several fatal diseases, which usually occur at an earlier age. Consequently, it is obvious that among women in this age group disabilities related to combinations of chronic non-fatal diseases are more important determinants of SRH than fatal diseases.

Gender effects were studied by Rijken et al. as well but they did not study co morbidity with back pain or headache.¹⁰ The other researchers did not study gender, which stresses the importance that correlations can differ by gender and, therefore, analyses have to be performed separately for men and women.

Strengths and weaknesses of the study

The strength of this study is the focus on a group of women with good access to GP-services, providing many data on health and health behaviour. By using a nationwide representative survey (the DNSGP-2), a high response was reached. A limitation is that the chronic conditions were self-reported. This implies a GP- confirmed diagnosis was missed. This may lead to an underestimation or overestimation of the conditions. However, it is questionable whether a non-self-reported chronic condition affects SRH. Another limitation is the definition of depression and anxiety. In the questionnaire, the question was whether the respondent ever felt very depressed of very anxious for more than two weeks, but other symptoms of a depression or an anxiety disorder were not part of the questionnaire and thus unknown. Nevertheless, Reme and Eriksen found that a single depression-question identified most of the depressive symptoms of a larger rating scale and, therefore, can be considered an indicator of depression.²⁵

Lastly, the method of measuring the SRH-ratio used is unorthodox. Even though a high response was reached, the group of women with only one chronic condition was too small to measure a ratio by taking the rate of women with the combination of two chronic conditions with a

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high SRH, and the mean SRH of women with the two conditions separately. Of the 315 women, only 71 had one chronic condition and the most prevalent single condition without multimorbidity was anxiety in 14 women. By using this method, we realize that we made an underestimation of the impact of multimorbidity on SRH, which only strengthens the conclusions.

Effects of chronic conditions on SRH were found. Of course, we have to be very modest when interpreting cross-sectional studies and causality. It is difficult to say whether causal direction goes from severe headache or severe back pain to low SRH or the other way around. Nevertheless, a significant relation was found between severe headache or severe back pain in combination with a chronic condition and SRH, which needs further attention.

Implications

Embarrassment, inconvenience, or acceptation and adaptation by elderly women make conditions like headache and back pain largely invisible to the GP.¹⁵⁻¹⁷ Therefore, an active role of the GP is crucial to determine the extent and severity of both severe headache and severe back pain to act. Future research on the effects of treatment of severe back pain and severe headache on the SRH of older women with co morbidity is recommended, preferably by randomized controlled trial.

Conclusion

All combinations including severe headache and some combinations including severe back pain and another chronic condition, have a significantly more negative impact on SRH in women aged 70 – 74 years than expected. Taking into account that hidden pathology such as severe headache and severe back pain in combination with a chronic condition is a trigger for low SRH, GPs should be very alert on these hidden conditions in women aged 70 – 74 years to add to the quality of the later years of life.

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General Discussion

General discussion

In the previous chapters we presented the results regarding gender aspects in prevention, facilitators, barriers and readiness of general practitioners (GPs) in the implementation of prevention programs in general practice, and points of action for prevention in women. In this last chapter we will discuss our main findings and conjoin them. We will discuss the implications for practice and research and recommendations at the end of the three main themes in our discussion.

Main findings

We aimed to find an answer to the question whether the overrepresentation of women among the visitors in general practice actually reflects women at high risk for lifestyle related diseases. Indeed, women see their GP frequently, especially women who smoke, resulting in the consultation rate of smoking women being twice that of smoking men. Moreover, access to GPs for smoking women is not influenced by socio-economic status (SES). The women aged 45 to 49 years old with a low SES visiting their GP had a substantially elevated risk for coronary heart disease (CHD) and osteoporosis. Of these women a high proportion (more than eighty percent) reported at least one yearly visit to her GP. Overall the group of women at lower risk. Consequently, prevention by means of passive case-finding, i.e. on the occasion of a consultation for another reason, is applicable to women in general practice and there is less need for a proactive strategy in women compared to men. The overrepresentation of women, or rather the underrepresentation of men, especially men who smoke, leads us to the conclusion that preventive actions by means of passive case-finding might be less attainable and less successful in men than in women. Therefore the answer to our question whether prevention programs in general practice should be gender-sensitive is positive.

GPs are ideally positioned for prevention and health promotion, but since the implementation of prevention programs in general practice appears to be difficult we aimed to find an answer to the question why the implementation of prevention programs takes so much efforts and what GPs need to successfully implement preventive actions into their daily practice. Financial and logistical support and the GPs' fear to lose the domain of prevention to other health care professionals are the main facilitators for implementing prevention programs in general practice. The main barriers for implementing prevention are the combination of insecurity about (continued) reimbursement and the lack of scientific evidence. We hypothesized that the ethical view of GPs that everyone should have the same right to obtain preventive care gradually takes over the inclination to hold on to evidence based prevention.

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We compared the attitudes and working methods in selective prevention of cardiometabolic diseases among Dutch GPs to the results of a comparable study previously performed in 2008. We found that even though more GPs in 2013 actively invite patients to their practice for preventive measurements, they feel less need to implement preventive activities of cardiometabolic risk factors in their practice. The number of the GPs who reported that it is worthwhile to detect patients at increased risk for cardio-metabolic diseases was significantly lower after the publication of the module cardio-metabolic risk of the guideline Prevention Consultation and less GPs considered the guideline as useful. In 2013, more male than female GPs actively invite patients to visit the practice for preventive measurements. Also in this study GPs consider the lack of financial support and the lack of evidence about the (cost-)effectiveness of selective prevention of cardio-metabolic diseases as a barrier for further implementation.

In order to identify windows of opportunity in general practice to implement prevention for women in all phases of life we studied the visits to their GP in three age groups of women. A high proportion of young women aged 18 to 22 years old (more than eighty percent) visited their GP at least once a year. As many of them reported an unhealthy lifestyle, we aimed to find a starting point for influencing the risky lifestyle of young women. Focusing on self-rated health (SRH) of young women is of no use, as their lifestyle and risk behaviour was not associated with their current SRH. Because of the high consultation frequency of young women GPs still can play a challenging key role in prevention, but they need to find a different approach for discussing lifestyle.

Premenopausal women showed a high prevalence of unhealthy lifestyle and high consultation rates as well. Many had an unhealthy lifestyle and an elevated risk for CHD and osteoporosis, especially the women with low SES. As the women with low SES visit their GP frequently, general practice is, from the prevention perspective, the tailor-made context to address the risks of these women.

The majority of women aged 70-74 years reported one or more chronic conditions and the more chronic conditions women suffered from, the lower women rated their health. Either severe back pain or severe headache was included in the most prevalent combinations of two chronic conditions with a significantly higher negative impact on SRH than expected. This implies that from a preventive and anticipating point of view GPs should be alert on multimorbidity, particularly on combinations including severe headache and severe back pain, to be able to improve quality of care by means of health care related prevention and thus add to the quality of the later years of life.

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Gender and prevention

Patient gender and prevention

We found that men consult their GP less frequently than women. Smoking women see their GP more often than smoking men, reflected by the consultation rates of smoking men being half that of smoking women. A GP, therefore, sees a smaller proportion of smoking men than of smoking women, both as a result of a lower consultation rate and as a result of a lower number of men consulting their GP at least once a year. Preventive actions by means of passive case-finding are therefore less attainable and successful in men than in women because of the mens' lower attendance rate.

Previous studies show that men are less likely to visit the doctor's offices and utilize preventive care than women. High-risk behaviors and low utilization of health services may contribute to the lower life expectancy in men.¹ In combination with our results regarding the lower consultation rates of smoking men, this only strengthens the conclusion that prevention programs must be gender-sensitive. One could deliberate on a program in which men are actively invited for preventive actions and women are addressed via passive case-finding.

A different approach to prevention in men and women is important, because there are gender differences in risk factors for disease, in lifestyle, in mortality and in health related behavior.² Smoking is one of the main preventable causes of premature death,^{3,4,5} the leading preventable cause of cardiovascular disease⁶ and a major cause of cancer⁷ in both men and women. Although the prevalence of smoking is still higher in men than in women, the percentage in women is dropping much more slowly than in men. In 1958, 90% of the men and 30% of the women were smoking, in 2012 27% of the men are smoking and 25% of the women in the Netherlands. The rise of the percentage of smokers in 2012, after the stop of compensation for smoking cessation medication via health insurance, was completely due to the rise of female smokers from 23 to 25%.⁸

In all age groups we studied, the number of smoking men was higher than the number of smoking women. But it appears that the epidemic of smoking-attributed mortality among women continues to increase, whereas the smoking-attributed mortality among men is decreasing.⁹ The gap between male and female lung cancer incidence is narrowing, particularly in northern and western Europe.¹⁰ This phenomenon has also been observed since the mid-1990s in Dutch women of 50 years and over.¹¹ Women are especially at increased risk because the tobacco industry views women as its growth market.^{12,13,14} Moreover, women have less success at quitting and metabolize nicotine faster than do men.^{15,16,17}

We studied risk behaviour in relation to consultation rate and self-rated health. We didn't study the consequences of risk behaviour in women, but since these subjects are intertwined and

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therefore relevant we will pay attention to research about gender-sensitive adverse effects of risk behaviour.

Smoking and gender

The increasing rates of smoking among females are worrisome because of the greater vulnerability of females than males to many of the adverse health effects of tobacco.¹⁷ Evidence from a review of data from more than 2.4 million people and more than 44,000 CHD events suggests that, compared with nonsmokers, women who smoke have a 25% higher relative risk of CHD than male smokers, independent of other cardiovascular risk factors. Whether mechanisms underlying the gender difference in the risk of CHD are biological or related to differences in smoking behaviour between men and women is unclear.¹⁹ Unlike CHD, where there is clear evidence of a significant difference between men and women, for stroke the evidence indicates that smoking confers a similar risk in women and men alike.²⁰

Evidence suggests that there are some very important differences between women and men in the relationship between lung cancer, genetic and environmental factors.²¹ Women may be more susceptible to the dangers of tobacco carcinogens.²² But also types of cancer that are predominantly or entirely found in women, such as breast cancer and cervical cancer, are negatively influenced by smoking^{23,24,25}

Whether gender and COPD are related is still ambiguous. There is evidence that female gender is associated with lung function reduction and more severe disease in subjects with COPD with early onset of disease or low smoking exposure, which suggests a gender difference in susceptibility to the lung-damaging effects of cigarette smoking.²⁶ But other research shows no evidence of an increased susceptibility to COPD among female compared with male smokers.²⁷

Although the awareness of CVD in women has increased, a significant gap between perceived and actual risk of CVD remains.²⁸ Relatively few women are aware of gender-specific health risks of smoking.²⁹ These gender-specific health risks include, besides earlier mentioned types of cancer, also infertility,^{30,31} poor pregnancy outcome,^{32,33} early menopause³⁴ and osteoporosis.^{35,36} This low awareness of women, but of physicians as well, are in the light of the changing smoking habits of women an important point of action for education, public health programs and guidelines.

Alcohol and gender

In a Dutch study among older people with data from the Longitudinal Aging Study Amsterdam it appeared that in the age group of 55-65 years alcohol consumption has considerably increased over a period of ten years. This increase is stronger among females than among males.³⁷

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There is evidence that detrimental effects of alcohol are larger in women than in men. In a literature search Amrani et al. found in four of the eleven studies that described gender interactions between binge drinking and neurocognition that females seem to be more susceptible than males to deficits in spatial working memory and impulse control.³⁸ Brain magnetic resonance imaging scans from 385 adults aged 60 to 64 years revealed that alcohol consumption is detrimental for women at lower levels of consumption than for men.³⁹

On the other hand women seem to benefit more from the cardioprotective effects attributed to alcohol consumption. Harriss et al. found that usual daily alcohol intake was associated with reduced CVD mortality for women but not for men. Drinking frequency was associated inversely with CVD death for men but not for women.⁴⁰ Snow et al. found that the relationship between regular alcohol consumption and decreased risk of CVD may not become evident until middle age or older in men. Women may benefit from usual consumption at a much younger age.⁴¹

Cardiovascular disease management and gender

An argument for gender-sensitive prevention programs arises from the results of an Australian study where 1,258 general practitioners recruited 12,509 individual patients whose cardiovascular risk factor levels were measured. This study found less intensive management of cardiovascular risk factors in CHD patients, particularly among women, despite equal cardiovascular risk levels. Why this gender difference exists seems to be unknown.⁴² In a review of a total of 447,064 patients it appeared that the relative risk for fatal CHD associated with diabetes is 50% higher in women than in men. This greater excess coronary risk may be explained by more adverse cardiovascular risk profiles among women with diabetes, combined with possible disparities in treatment that favor men.⁴³ The fact that men with high-risk behaviors report low utilization of health services, that women with CHD are less intensively treated and women with diabetes have a higher risk for fatal CHD emphasizes the importance of a gender-sensitive approach towards prevention, i.e. an unequal approach to obtain equal results.

GP gender and prevention

We found that significantly less female GPs than male GPs reported to actively invite patients for preventive measurements. No gender differences were found regarding both strategies of active working methods, namely when the GP invited patients for preventive measurements or when the GP invited only those patients for preventive measurements who came to the GPs' office for other complaints. The female GPs seem to compensate for actively inviting patients for prevention with preventive measurements in patients who visit the general practice for other complaints, probably

enabled by the longer consultation time female GPs have,^{44,45,46,47,48} although longer consultation time by female GPs is not confirmed by all studies.⁴⁹

Studies show that female GPs practice differently than male GPs.^{50,51} Female GPs engage in more patient-centred communication.^{46,52} They provide more counseling and immunization services and compared to male GPs they are more active in preventive counseling but they are equal to male GPs in preventive screening.⁵³

There is some evidence of the presence of a physician-patient gender concordance in prevention. Female physicians appear to be more prevention oriented, particularly for female prevention, ^{48,54,55} such as breast examinations and mammograms, cervical cancer screening and pelvic examinations, but also rectal examinations and blood pressure measurements. ⁴⁸ This physician-patient gender concordance could not be confirmed in other studies. ^{53,56,57} We did find some additional evidence for physician-patient gender concordance in our studies: female GPs seem to prefer to perform preventive actions by inviting patients for preventive measurements who came to the GPs' office for other complaints. This type of prevention is more suitable for female patients, especially for those who smoke, because they frequently visit their GP. Male GPs on the other hand, are more prone to actively invite patients, which is more suitable for male patients, especially those who smoke, who visit the general practice less frequently.

The GP profession is becoming feminized.⁵⁰ In the Netherlands the number of female GPs increased from 1,961 (25% of all GPs) in 2000 to 3,532 (40% of all GPs) in 2010.⁵⁸ It appears that there is a difference in working methods towards selective prevention between male and female GPs. Therefore, gender of the physician should be taken into account when planning a prevention program and when evaluating a program.

Implications for practice and research

Gender-sensitive education

Gender needs to be recognized as an essential determinant of illness and health.⁵⁹ Toine Lagro-Janssen concluded that gender awareness means that healthcare professionals have a gendersensitive attitude as well as a knowledge and understanding of the full significance of gender in illness and health.⁶⁰ The lacking competence of health professionals to perceive gender issues is considered to be one of the main starting points to improve gender-sensitivity in health care. In the basic medical curriculum of the Radboud University Nijmegen Medical Centre integrating gender into the basic medical curriculum has been largely successful. Motivated teachers proved to be as important as the practical relevance of educational materials to promote the adoption of gendersensitivity among students.⁶¹ In the Netherlands, gender-sensitive medicine training has already been successfully integrated into an existing GP training curriculum. GP trainees reported that

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gender-specific medicine is important and they were interested to learn.⁶² It is therefore important to implement and integrate gender in all basic medical curricula, but also in all professional programs, especially in GP training curricula and in other training institutes for postgraduate education. This should also include gender differences in prevention, as well as the more frequently studied gender differences in diagnostics and therapy. Efforts to continue this integration of gender in education is an important responsibility of all medical faculties and of the government. With regard to the government a resolution by Agnes Wolbert, a Member of Parliament of the Dutch Labor Party, was adopted, which requests the government to make women-specific healthcare an integral part of all medical educations programs.⁶³

Gender-sensitive awareness

We have to take the low awareness of the cardiovascular risks of women and of the dangers of smoking in women into account, both of female patients and of physicians as well. This indicates that GPs and other physicians must be trained to become gender-sensitive when it comes to prevention issues and lifestyle. A Dutch study shows that a training program for GPs stimulated their gender-sensitivity.⁶⁴ In the light of the changing smoking habits of women, increasing awareness of the dangers of smoking in women is an important point of action for education, public health programs and guidelines.

Gender-sensitive research

In every research for the effectiveness of prevention results must be evaluated in a gender-sensitive way. It is important to study gender differences in effectiveness of universal, selective, indicative and health care related prevention programs. Furthermore we recommend to study gender differences in the accomplishment and results and success rates of lifestyle advice and treatment after a risk factor or disease has been found. Lastly, we advise to study the difference between men and women when it comes to the way they are approached and invited to join a prevention program, screening program or lifestyle counseling.

GP gender

Gender of the physician should be taken into account when researching prevention, when planning and implementing a prevention program and when evaluating a program. We also advice to take the –whether or not gender-sensitive- preference of the GP into account when planning a prevention program en we advice to study in which way this preference affects success rates of prevention, in order to accomplish prevention programs both fit for individual GPs and their patients. A question

about the personal preference of the GP, e.g. active invitations versus passive case-finding, must be a part of a questionnaire when studying prevention programs in general practice.

The implementation of prevention

Attitudes, working methods, facilitators and barriers for the implementation of prevention in general practice

In the two studies we performed on this subject (chapter 3 and 4) we found several facilitators and barriers for the implementation of prevention in general practice in the Netherlands. Facilitators and barriers have always been present in the prevention debate. During the mid 1980s, a substantial part of Dutch GPs had no intention to implement preventive tasks in their daily work as they regarded prevention as not falling within their remits. So there has been a shift from 'no intention to implement prevention and cervical cancer screening'. In an exploration in 2012 by the Maastricht University, Faculty of Health, Medicine and Life Sciences, Weyers et al. concluded that though many interviewed stakeholders in health care are positive about the module cardio-metabolic risk of the guideline Prevention Consultation, the acceptance and the implementation is not easy to realise.⁶⁵

Financial support versus time and workload

In both studies we found that the lack of financial support is one of the main barriers for the further implementation of selective prevention in general practice. The presence of financial and logistical support are important facilitators for prevention. Almost three quarter of the GPs would be inclined to carry out selective prevention if it would cost them little extra effort.

Many studies confirm our outcomes. In a study of McIlfatrick et al. about the role of the GP in cancer prevention the two main barriers identified for the actual and potential role of the GP in cancer prevention were remuneration and issues related to workload and time.⁶⁶ The need to address the patients' problems during the consultations and the time available limited the opportunity to engage in prevention activities, unless directly linked to the presented problem.⁶⁶ The same conclusion was drawn by Brotons et al. in a postal multinational survey of 2082 GPs, who found that the most important causes for not implementing prevention were heavy workload, lack of time and no reimbursement.⁶⁷ These were also three of the most important barriers identified in a WHO survey in 1998 of more than 2300 GPs in 16 countries, together with unsupportive government health policies, and insufficient training.⁶⁸

In motivating GPs to implement selective prevention programs it is important to offer them sufficient time and financial support for the extra time spent or, if desired, to employ extra personnel. Practice nurses can be helpful in organizing and carrying out parts of these prevention programs. Political choices have to be made in order to financially facilitate selective prevention in general practice, not only the actual measurements and counseling, but also the time investment for an appropriate selection of patients prior to the invitation, and invitation logistics. An important prerequisite for prevention during a consultation is extra time for this consultation. The time available during the present ten-minutes consultation is insufficient to address lifestyle issues or other preventive actions.

A change to longer consultations is not without costs. In order to achieve longer consultations, general practitioners have to reduce their list size. Alternatives would be to decrease the patients' consultation rate with the doctor, perhaps by increased task delegation, or have longer working days.⁶⁹ An increasing use of self-management options by patients might lower the consultation rate in the future, but more evidence is needed to support this prediction. A systematic review of RCTs evaluating the Stanford Chronic Disease Self-Management Program showed no statistically significant differences between self-management or usual care with respect to visits with general practitioners.⁷⁰ And in the Netherlands the application of eHealth aimed at selfmanagement is still uncommon.⁷¹

Scientific evidence

We found that the lack of scientific evidence for the effectiveness of prevention was one of the main barriers both for the implementation of systematic influenza vaccination and for the implementation of cardio-metabolic risk management. Moreover, 95% of the GPs mentioned scientific evidence about the effectiveness of selective prevention as a facilitating factor for the implementation of cardio-metabolic risk management.

This seems to be in contrast to qualitative studies that concluded that over the past years concerns are rising about the decreased use of evidence-based medicine in health care, for physicians report that practice guidelines can conflict daily practice.⁷² The calls for an increase in the practice of evidence-based medicine seem to be obstructed by many barriers hampering the implementation of evidence-based thinking and acting in general practice^{72,73,74}

Even though we found many studies that described barriers and enablers of the implementations of prevention, the lack of scientific evidence for the effectiveness of prevention as a barrier for implementation was not one of them. As we found this barrier in both our studies concerning the implementation of prevention programs in the Netherlands this is a new finding adding to the body of knowledge on barriers of prevention.

Prevention and equity

We hypothesized that the ethical view of GPs that everyone should have the same right to obtain preventive care gradually takes over the inclination to hold on to evidence based prevention. We noticed that the professional opinion about equity plays a pivotal role for many GPs to take up prevention. The discussion on social health inequities in the Netherlands might have contributed to this shift in opinion.

In 2005-2008 in the Netherlands the difference in life expectancy between higher and lower educated men and women is 7.3 and 6.4 years respectively.⁷⁵ It is unknown whether national general health programs reach people with low SES.⁷⁶

We found that the GP reaches the high risk groups of premenopausal women with low SES and we stated that screening activities in private commercial clinics for the 'worried well' do not reach these high risk groups of women of low SES. We concluded that Dutch GPs seem to be in an ideal position for prevention because access to GPs is not influenced by SES for women aged 45-49. Older research shows that Dutch people with primary education used the GP services even more than people with higher vocational training or a university degree.⁷⁷ In the UK no association was found between the utilization of primary care and social vulnerability.⁷⁸

Smit et al. studied the difference of the reach and effect of smoking cessation programs between recruitment via mass media or via Dutch general practices. The smokers recruited via general practices were significantly lower educated, more often female and more often suffering from cardiovascular or respiratory diseases than smokers recruited via mass media. Moreover, general practices respondents showed higher retention rates and were more successful in quitting smoking.⁷⁹ In the Netherlands an invitation by a GP for the cervical cancer screening program led to a higher attendance rate than invitation by a municipal health service in women with a low socioeconomic status.⁸⁰

The Dutch health care system is characterized by free and equal access to care irrespective of SES. Nevertheless, socio-economic health differences exist. The challenge is to organize a collaboration of GPs and other health care professionals, the local government, but also private partners, to join forces in prevention. An important role is there to play for the health insurance companies, for they represent all of their insured people and are able to facilitate cooperation.

The position of the Dutch GP

We found that the GPs' fear to lose the domain of prevention to other health care professionals was one of the main facilitators for implementing prevention programs in general practice, such as the systematic influenza vaccination. In our study about attitudes and working methods concerning selective prevention we found that - although GPs consider general practice as the most appropriate

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setting to carry out preventive measurements -, they nowadays more often consider that a cardiometabolic risk check may also be performed in other health institutions, namely municipal health services, hospitals, diagnostic centre/GPs' lab or occupational health services. This change in attitude towards losing the domain to other health care professionals can be explained by the more firm position of general practice nowadays and by the increasing workload perceived by GPs. The more firm position of Dutch general practice is visible in the development of the incomes of the Dutch GP, ⁸¹ but also by the ever enlarging role for the GP in mental health care, care for older people and chronic diseases such as diabetes mellitus type 2 and COPD. This enlarged role for the GP increases the workload. This increasing workload creates a difficult balance for GPs between the daily presented, more or less acute, health care issues and the wish to prevent diseases. This is also the conclusion derived from a mixed methods approach among 345 GP practices in the UK. GPs indicated that time dictates that their primary role is more focused on treating presenting problems rather than preventing future ill-health.⁶⁶

The position of the GP as a profession has become stronger. At the same time less GPs reported that it is worthwhile to detect patients at increased risk for cardio-metabolic diseases after the publication of the module cardio-metabolic risk management guideline and they are more willing to leave prevention to other health care professionals, likely due to the increasing workload. It is important to take these outcomes into account when implementing prevention in general practice.

Implications for practice and research

In the British Journal of General Practice in March 2000 Brian McAvoy wrote that there is an accumulating extensive body of evidence on the potential of primary care-led health promotion to benefit patients and to reduce the burden of disease. He stated that "the inaction of health professionals, policy makers, and politicians in the face of such overwhelming evidence is both scandalous and yet another example of the enormous difficulties of getting evidence into practice". He concluded that a number of factors are responsible for this inaction, including bias towards treatment- based interventions, professional and political barriers, and lack of incentives to change.⁸²

Organizational infrastructure in general practice

Whether a GP actively invites patients for preventive measurements or whether a GP performs these measurements during a consultation for another complaint, either way it takes an investment in time. An important prerequisite for prevention during a consultation is the length of the consultation, which should be longer than ten minutes consultations, the current situation in the

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Netherlands. To extend the length of consultations, the direct consequence is scheduling less appointments during office hours.

Clinical task substitution to for instance a practice nurse, a nurse practitioner or a physician assistant is one option to address the increase in demand associated with prevention. Nevertheless, as earlier mentioned the task of the GP is bound to increase anyway owing to agreements with the Minister of Health about task substitution for chronic diseases and mental health care, and with the population aging. A disadvantage of task delegation is that the perceived distance between the GP and the patient enlarges. Another disadvantage is that practice nurses work with structured disease management protocols for patients with diabetes mellitus type 2, CVD and COPD, but are less trained to pro-actively use the windows of opportunity we found. And task delegation of 'easier problems' leads to more GP-consultations for more complex problems, which leaves less time for prevention. Lastly, more personnel means more workplaces in the practices and an extra management task for the GP.

Another option is decreasing the number of listed patients. In Europe the number of listed patients per Dutch GP is one of the largest. Only GPs in Ireland have more patients per GP.⁸³ A lower number of listed patients would imply a higher capitation fee per patient. This is one of the political choices that have to be made in order to financially facilitate selective prevention in general practice.

Collaboration of (local) stakeholders

To encourage collaboration concerning prevention between all the stakeholders to improve the health of a population, such as health professionals, the local government, Municipal Health Services, health insurance companies and commercial parties, we recommend to reserve funds for prevention within a population-based budget. The budget for prevention therefore should be enlarged, instead of being decreased, as happened in the past years.⁸⁴

Particularly health insurance companies can play a role in prevention, more than they do now. A substantial role, not only as window dressing, but because prevention when possible is better than cure when necessary. This role must be translated into a separate and sufficient budget for prevention, at greater length, to create space and time to develop preventive activities in primary care. Besides more time per patient and according remuneration for the time consuming risk selection for selective and indicative prevention programs, health insurance companies can also reward GPs who monitor risk factors of their patients in the form of a prevention module, for instance the monitoring of smokers. GPs who have obtained these data then receive for instance a higher capitation fee or even a reward for a high percentage of smokers who quit.

The central government

In 2010 the Council for Public Health and Health Care published a discussion document "Zorg voor je gezondheid" [Care for your health]. In this document the Council advocated for a change from 'care and disease' to 'behaviour and health'. This arrives from the idea that patients in the next decade do not fit in the 'care and disease' approach anymore. The Council predicts that people will not turn to health care institutions in case of illness. They want to remain healthy. They want to participate in society, which means another supply of care.⁸⁵

At the present moment the largest part of health care, including general practice, is focused on illness and disease, and less on behaviour. This conclusion is also indicated by the recent financial cuts on mental health care, the varying policy on remuneration of smoking cessation programs and dieticians in the past years and the unclear rules whether certain treatments for smoking cessation are covered or not. Prevention aims at behaviour, and in the opinion of our present Minister of Healthcare this is the individual responsibility of people. The National Institute for Public Health and the Environment (RIVM) poses in the National Public Health Compass 2014 about prevention in healthcare that this own responsibility is both an opportunity and also a threat for prevention.⁸⁴

Fortunately, the Dutch government consented to a large scale prevention program for a period of three years, 2014-2016. Six ministries, local governments and social organizations are planning to work together to promote health and prevent diseases in the environment where people live, work and learn and to give prevention a more prominent position in health care.⁸⁶

With prevention the target is on health, not on disease. Therefore we advise that the government acts on the discussion document of the Council for Public Health and Health Care and stimulates prevention, not by implementing extra tasks, but to make it actually possible to successfully incorporate the prevention of diseases next to the present core business of GPs, which is curing diseases. This would imply a decrease of the number of listed patients, for the treatment of diseases will always prevail over prevention and other forms of collaboration in daily practice. Since disciplinary actions for physicians are mainly targeted at the (communication about the) treatment of patients, it is therefore not recommendable to make the shift to 'behaviour and health' without acknowledging that cure should always be accessible, at any moment of the day.

Evidence for prevention

One of the barriers we found for implementing prevention in general practice is the lack of scientific evidence. In McAvoy's opinion a way forward would be to provide GPs with evidence in a concise, readily-accessible, ranked list showing the potential of various preventive activities to reduce the disease burden of the community.⁸² In the National Public Health Compass 2014 about prevention in healthcare the RIVM authors state that some preventive actions are effective, such as prevention of

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smoking counseling in the perinatal care, cervical cancer screening and eHealth to prevent depression. In other examples of prevention programs evidence is lacking or inconsistent.⁸⁴

We recommend more research to provide evidence for the effectiveness of prevention and screening in general practice, both for health parameters and for cost-effectiveness. We need for instance more evidence whether and which smoking cessation programs work and whether gender plays a role.

With regard to the module cardio-metabolic risk of the Prevention Consultation further research is necessary to study whether the module will lead to a decrease of the number of patients with cardio-metabolic diseases, whether the module cardio-metabolic risk in particular is useful and whether selective prevention of cardio-metabolic diseases in general practice is cost-effective. Furthermore it is important to study lifestyle counseling versus medication when a risk factor or disease has been found to acquire more knowledge on the most effective way for indicative prevention.

Points of action for prevention on women in general practice

Creating windows of opportunity

Because of the high consultation frequency of women of all ages in general practice we concluded that prevention by means of case-finding is opportune for women. Therefore it is important to find or create a window of opportunity to address lifestyle and provide lifestyle related advice by the GP. Preventive activities that are already implemented in general practice are suitable to create this occasion, both because many screening programs are targeted on women, and general practice is accepted as a place to receive lifestyle advice.⁸⁷ In a survey among 298 Dutch patients identified with an elevated cardiovascular risk most patients did not have any major objections against the organization of preventive care by means of case-finding in general practice.⁸⁷ Moreover, patients who believe their health is controlled by themselves rather than by others or by chance, are more likely to participate in a screening program like cervical cancer screening,⁸⁸ consequently they are more open to lifestyle advice by their GP.

But also other reasons for contact with the GP can be an opportunity for prevention and lifestyle advice. In 1983, a GP from London described how he carried out a package of five preventive actions (blood pressure measurements, cervical cytology, collect data on smoking, contraception and rubella immunity). He concluded that in a subgroup of young women aged 17-30 it is possible to carry out reasonable levels of preventive actions in ordinary consultations in general practice.⁸⁹ In a review Senore et al. states that the retrieved studies suggest that the screening

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setting in established screening programmes, or pilot screening projects, may offer valuable opportunities to provide credible, potentially persuasive lifestyle advice reaching many people.⁹⁰ Other research shows that although morbidity and mortality associated with smoking, alcohol consumption, illicit drug use, unsafe sexual practices, family violence and sexual abuse have been well documented, routine screening for these risk factors during general medical examinations has yet to be integrated into medical practice.⁹¹ This means that screening for risk factors and lifestyle advise during consultation in general practice might be feasible, but inhibiting factors need to be taken into account before actual implementation.

A lifeline of prevention

We arranged the windows of opportunity according to the three age groups we studied. Evidently, many of these actions are also applicable for other age groups of ages in between, and younger and older women than the age groups we studied.

Contraception

When a women consults her GP for any kind of contraception this opens a window of opportunity to ask for risk factors, such as risk factors related to the adverse effects of the combined hormonal contraceptive pill together with smoking. In the Dutch contraception guideline smoking women aged 35 years and over who are not prepared to quit smoking are advised against taking combined preparations.⁹² It is also an opportunity to assess sexual health risks, to assess a history of sexual abuse and for sexual transmitted disease (STD) counseling in order to prevent STDs.⁹³

We advise an assessment of sexual health risks and a history of sexual abuse when a women asks for any kind of contraception. A GP can inform women who use combined hormonal preparations and who smoke about the dangers, and if they are motivated to change their lifestyle GPs can counsel them on the risks of the combination, determine a cardiovascular risk profile and actively offer them smoking cessation support. The importance of this intervention grows when women get older, especially in women of 35 years and over.

Preconceptional advice

By addressing risk factors before conception, couples have the maximum opportunity to optimize their chances of an uncomplicated pregnancy and a healthy child.⁹⁴ Whether the awareness of the benefits of a healthy lifestyle for the future health increases when women consider to become pregnant seems to be unknown. We know that for instance the preconceptional use of folic acid is low. In a Dutch study in 2009 and 2010 55.5% of the women used folic acid supplements before conception, which is suboptimal and has not improved over recent years.⁹⁵ In a multi-ethnic Dutch

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pregnancy cohort between 2002 and 2006, adequate preconception use of folic acid was as low as 37%. In this study pregnancy planning appeared to be the most important factor for inadequate folic acid use.⁹⁶

Future pregnancy plans can be a point of action for prevention of health risks both for the woman herself, but also for her children and even for her partner. In a Dutch study it appeared that none of the couples with future pregnancy plans reported no risk factors at all and only 2% of the couples reported risk factors for which written information was considered to be sufficient. Therefore, 98% of all couples reported one or more risk factors for which at least personal counseling by a GP was indicated,⁹⁷ which strengthens the important role of the GP and of a preconception consultation by the GP, not only to address risk behaviour and the use of vitamins, but also to inform about medication use, the prevention of infectious diseases like toxoplasmosis, and information about prenatal testing. Temel et al. concluded in a review that there is a relatively short list of core interventions for which there is substantial evidence of effectiveness when applied in the preconception period. Regarding alcohol, evidence is lacking for interventions in the preconceptional period. Regarding nutrition, preconceptional interventions are effective in terms of dietary change and birth weight. Smoking interventions are effective in achieving smoking reduction in the preconception period. Regarding folic acid, individual interventions and collective interventions to increase folic acid use are effective in terms of behavioral change and improvement of pregnancy outcomes.⁹⁸ Regarding the health of the pregnant women, screening for haemoglobinopathies in women at risk makes midwives and obstetricians aware of the possibility of anaemia and urinary tract infections during pregnancy.99

A study among women aged 18-40 shows that women are certainly interested in preconception counseling when it is actively offered by their own GP. Over two-thirds of the women in this study were either interested in or would definitely consider counseling, should they decide to have children.⁹⁴

We advise both an active prevention program and case-finding of women who want to become pregnant. The emphasis should be on pregnancy planning and on information about risk behaviour, such as smoking, nutrition and folic acid use in order to motivate women to change their lifestyle. But also when prescribing a new drug or when diagnosing a new disease in women of reproductive age can be seen as a chance to address pregnancy plans and further counseling.

Pregnancy

Pregnancy acts as a maternal stress test that can predict a woman's health in later life.^{100,101,102} Women who develop pregnancy-induced hypertension, pre-eclampsia, HELLP, or gestational diabetes mellitus are at increased risk of developing hypertension,¹⁰³ diabetes mellitus type 2¹⁰⁴ and

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cardiovascular disease in later life.^{100,102,105} A history of miscarriage or recurrent miscarriage is associated with a greater risk of subsequent CHD.^{106,107} The pregnancy complications may be useful markers of latent high-risk cardiovascular trajectories, for many complications appear to be preceded by subclinical vascular and metabolic dysfunction.¹⁰²

In the 'Effectiveness-based guidelines for the prevention of cardiovascular disease in women' of the American Heart Association healthcare professionals are advised to take several factors beyond the Framingham risk score into consideration in female patients. They should take a history of pregnancy complications to determine the risk for future CVD and monitor their risk factors carefully.¹⁰⁸ These women at higher risk for CVD should be advised to adjust their lifestyle postpartum by adjusting their diet, exercising regularly and having their blood pressure and plasma glucose levels monitored periodically,¹⁰⁰ for which the GP is ideally placed. Appropriate referral postpartum by the obstetrician to the GP in case of pregnancy-induced hypertension, pre-eclampsia, HELLP, gestational diabetes or recurrent miscarriages is a prerequisite for this kind of preventive care, so that in the years after pregnancy, risk factors can be carefully monitored and controlled.¹⁰⁸

Cervical cancer screening

In a study of Gorini et al. about smoking cessation counseling delivered by midwives to smokers during the screening for cervical cancer this intervention turned out to be effective.¹⁰⁹ This finding makes cervical cancer screening an opportunity for lifestyle advice, for in the Netherlands cervical cancer screening is performed in general practice. Nevertheless, we have to consider factors that decrease compliance with cancer screening, such as SES and health illiteracy. The relation we found between SES and risk behaviour was found in other studies as well.^{110,113,112} Several studies show that low SES remains an important factor in reducing compliance with cancer screening in women.^{110,113,114,115} This only enlarges the need to invite women for screening activities, especially women with low SES, when they visit the practice for another reason, and to make sure that the GP invites the patient. In the Netherlands an invitation by a GP leads to a higher attendance rate than invitation by a municipal health service, especially in groups with a traditional low level of attendance.⁸⁰

Awareness about the benefits of cervical cancer screening increases the likelihood of attendance in an organized cervical screening program.¹¹⁶ Special attention is required for victims of female genital mutilation, for embarrassment associated with female genital mutilation is a barrier for women to attend cervical cancer screening.¹¹⁷ The possibility of genital mutilation can be raised by the GP in women coming from certain ethnic groups in sub-Saharan countries and Northeast

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Africa who are at risk for being the victim of female genital mutilation and who do not respond to the invitation for cervical cancer screening.

We advise to actively ask for risk behaviour such as smoking, but also for urinary incontinence, sexual health risks and -if indicated- a history of sexual abuse, domestic violence and intimate partner abuse during cervical cancer screening. As in the Netherlands in many practices cervical cancer screening is performed by the practice assistant, GPs need to train their assistant to be alert to and ask for risk factors.

Menopause

The years proximate to menopause are accompanied by an increase in blood pressure and the prevalence of hypertension that may lead to complaints that are often attributed to menopause.¹¹⁸ The presence of vasomotor menopausal symptoms, commonly referred to as night sweatings and hot flushes, is associated with a less favorable cardiovascular risk profile and an increased CVD risk.¹¹⁹ There also appears to be a relation between vasomotor menopausal symptoms and a history of hypertensive disease in pregnancy.¹²⁰ Early menopause (before the age of 40) is related to a higher risk for CVD as well.^{107,121} The causality of this relation can go both ways: menopause may induce a change in cardiovascular risk profile by estrogen depletion, and a woman's atherosclerotic status may influence their age at onset of menopause.¹²²

Risk factor identification is poorly managed in middle-aged women and assessment of the cardiovascular risk of the individual woman should be the first step in the evaluation and treatment of perimenopausal symptoms.¹¹⁸ Together with measuring blood pressure, lipids en blood glucose levels in women with perimenopausal symptoms the GP must know the obstetric history. In the present Dutch menopause guideline performing these measurements is only advised when hormonal replacement therapy is considered. This seems to be a missed opportunity from a prevention perspective. Therefore we advise to discuss a possible elevated risk for CVD and subsequently offer a cardiovascular risk profile measurement to women with vasomotor symptoms during menopause.

Multimorbidity

Women suffer from more chronic conditions in old age than men.¹²³ The consequences of multimorbidity includes polypharmacy. In the Netherlands, 10% of all people who take medication long term take more than five different drugs. Of people over 75 years old this is more than one third.¹²⁴ Polypharmacy is difficult to monitor, especially in the elderly, because of pharmacokinetic and pharmacodynamic changes.¹²⁵ Polypharmacy is one of the major risk factors for falls,^{126,127} and polypharmacy leads to common medication-related admissions.^{128,129}

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In a study to analyze pharmacological interactions among drugs taken by elderly patients and their age and gender differences Venturini et al. found that most of the elderly who use drugs are female.¹³⁰ Since female patients may have a greater risk of developing adverse drug reactions than males due to multiple pharmacokinetic parameters,^{131,132}, to tackle polypharmacy in older female patients is a window of opportunity to increase quality of life and self-rated health.

The present guidelines for GPs must take multimorbidity into account. Collaboration of the general practitioner and the pharmacist concerning polypharmacy is, though time consuming and difficult to implement in the daily practice, very important, as is already advised in the multidisciplinary guideline polypharmacy in older people from the Dutch College of GPs.¹³³ This also applies to collaboration and coordination with other caretakers, such as informal caretakers, nurses and medical specialists.¹³³

Implications for practice and research

A normative 'one size fits all' approach, meaning that a gender-neutral policy stands for equality, should be left.² In her valedictory speech Toine Lagro-Janssen pictured this as follows: "Sometimes an inequal treatment for men and women is necessary to realize an equal chance for health".¹³⁴ Recently this appeal was addressed to people outside the medical profession as well by the Dutch organization Women Inc., which raised a lot of attention in the media. But what they really intended is to raise attention for the facts that women and men are different, and health care should therefore be different, just as Toine Lagro-Janssen has been doing for years.

From a preventive perspective we found a gender difference as well, which leads us to the conclusion that when planning a prevention program, gender must be taken into account. This is important, not only to stimulate research for gender differences in prevention and lifestyle counseling, but also to acquire more knowledge how to address and involve women. Lastly it is important to take gender into account for the implementation of prevention programs in the Netherlands, especially now the Dutch governments is about to present and implement a large scale national prevention program.⁸⁶ The implications of a gender-sensitive implementation for practice and research are described subsequently.

Protocols and guidelines

In several windows of opportunity for prevention in women we noticed that certain (gendersensitive) risk factors were absent in the present Dutch guidelines for GPs.

In the present guideline menopause of the Dutch College of GPs the relation between perimenopausal symptoms and cardiovascular disease is not mentioned, nor is the relation between pregnancy complications such as pregnancy-induced hypertension, pre-eclampsia, HELLP,

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gestational diabetes mellitus or recurrent miscarriages and future cardiovascular disease and diabetes mellitus type 2. A cardiovascular risk estimation and an obstetric history should be taken in every women who has ever been pregnant when presenting with perimenopausal symptoms, in the light of prevention of cardiovascular disease and diabetes mellitus.

The present guideline cardiovascular risk management of the Dutch College of GPs emphasizes the importance of calculating global, 10 years risk estimates, which is rather short-term, especially in premenopausal women. After all, a low risk for cardiovascular disease in the short term can be an actually high risk across the remaining lifespan.^{135,136} The increasing longevity of relatively healthy elderly women and the fact that prevention of non-fatal cardiovascular disease probably not only improves life expectancy but also functional status and wellbeing,¹³⁷ stresses the importance to look further than these ten years when gender-specific risk factors are found, such as a history of pregnancy complications, perimenopausal symptoms or early menopause. More gender-sensitive research is necessary to be able to make a reliable risk estimation without the risk of overtreatment and medication-related side effects and hospital admissions. Therefore trial evidence is urgently needed to substantiate the value of cardiovascular risk management for women with a history of hypertension during pregnancy.¹³⁸

Questions to inquire about an obstetric history of pregnancy-induced hypertension, preeclampsia, HELLP or recurrent miscarriages must be a part of the module cardio-metabolic risk of the guideline Prevention Consultation, as gestational diabetes mellitus already is. In the guideline cardio-vascular risk management these conditions should be mentioned as risk factors for CVD in women, as the American Heart Association advices.¹⁰⁸ Therefore we advise to add 15 years to the actual age in women with pregnancy related hypertension in the guideline CVRM, just like people with DM or rheumatoid arthritis, as is also advocated by Heida et al.¹³⁸

E-health, social media and computer systems

We know from the recent past that many girls refused vaccinations against the Human Papilloma Virus to prevent cervical cancer based on information on social media.^{139,140} Therefore we advise the use of e-health and social media to inform girls and women about gender-sensitive health risks, since we know that women and girls use internet and social media. Also we must not forget the illiterate women and women who are not able to read and speak Dutch. Without making these women too dependent of their partners or children we have to find a way to address these women as well. Partners and children can help to a certain extent, but a professional interpreter must always be available and reimbursed. In spite of the financial cuts in welfare and ethnic community organizations these organizations still can play an important role in educating these women. Local municipalities can facilitate this, preferably together with local health care professionals.

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An important prerequisite for a GP is a computer system, preferably a system with which it is possible to deliver input for prevention. After taking for instance an obstetric history the for prevention important parameters must be entered in the system in order to be helpful to remember both the GP and the patient that it is time for certain measurements. E-health, for instance by means of an app can also play a role to involve the patient in her treatment, offering tailor-made information for lifestyle changes and an alert when it is time for certain measurements.

More research and information is needed to implement apps into health care and prevention. In a systematic review of 309 apps focused on cancer and available for use by the general public the conclusion was that there are hundreds of cancer-focused apps with the potential to enhance efforts to promote behavior change, to monitor a host of symptoms and physiological indicators of disease, and to provide real-time supportive interventions, conveniently and at low cost. However, there is a lack of evidence on their utility, effectiveness, and safety.¹⁴¹

Awareness of risks and expectations from health care

It appears that women are not fully aware of the risks they are running. More consideration should be given to the knowledge of women about the risks for instance when they smoke or drink alcohol in excess. In young women creating more awareness for future health problems by involving school teachers and parents or caretakers is essential. Studies are needed to observe the health effects of increasing knowledge and awareness among these young women. But it is more important to study the expectations of the young women themselves: what do they need from their GP to be able to stay healthy?

Special attention is required for women with the lowest SES, because their unhealthier lifestyle is leading to a higher risk for CHD and osteoporosis. Interventions by their GP are needed to improve their health. Future research must focus on preventative efforts, like the implementation of nurse practitioners in GP-practices and (subsidised) motivational programs to stimulate and enhance physical activity, for it appears to be unknown whether national general health programs reach people with low SES.⁷⁶

Strengths and weaknesses

One of the limitations of the data we used from the Second Dutch National Survey of General Practice (DNSGP-2) is the time that these date were collected, namely over ten years ago. Even though the data are more than ten years old, we have no reason to believe that the relation between age group and risk behaviour and/or self-rated health has changed over time. Therefore we state that our results are still valid. In chapter 2 we studied to what extent gender plays a role in planning a

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prevention program in general practice. We compared our data to data from the Dutch Expert Centre on Tobacco Control (STIVORO)⁸ and the Dutch Central Bureau for Statistics (CBS)^{142,143} and we can conclude that, although the number of smokers has decreased in the past ten years, the gender difference is still about the same. Though differences in yearly GP contact and consultation frequency between men and women are slightly leveling out we still see a large gender difference in use of primary care. Based on these findings we presume that our conclusions are still valid. As far as we know we are the first to study the relation between consultation frequency, gender and risk behaviour, so were not able to compare our data to pre-existent data. Regrettably, large studies such as the DNSGP-2 are not performed anymore in the Netherlands. Because of the wide range of questions of the DNSGP-2 we were able to study relationships between risk behaviour, socioeconomic status and self-rated health, and multimorbidity and self-rated health. But also the relationship between consultation frequency and risk behaviour and gender.

We chose three age groups for reasons we explained in our general introduction. The advantage of our age groups is that for chapter 2 we can assume that the influence of age and gender related issues on consultation frequency, such as pregnancy and menopause, is relatively limited. One of the disadvantages of choosing our age groups is that certain groups are missed and not represented. For instance, our youngest group is probably not yet pregnant, but we don't know whether lifestyle adjustments are made when they make plans to conceive or when they have children.

Even though the response rate of the DNSGP-2 is high we have to take our results of chapter 2, 5, 6 and 7 modestly, because of the cross-sectional nature of the studies. For instance when we studied the relation between smoking and GP consultation, this relation could be affected by a healthy smoker bias: 'unhealthy' smokers may have already quit smoking whereas 'healthy' smokers continue to smoke. Although we found a relation between self-rated health and chronic conditions it is hard to interpret causality in cross-sectional studies. It is difficult to say whether causal direction goes from severe headache or severe back pain to low self-rated health or the other way around. We found significant relations between self-rated health and multimorbidity, between socio-economic status and risk behaviour and between consultation frequency, gender and risk behaviour. These results need further attention.

We used a qualitative approach to study the history of decision making and implementation of prevention programs in primary health care in the Netherlands by means of a witness seminar. This method allowed us to make an in-depth analysis of the prevention discussion in the past. One of the theoretical weaknesses of this method is the risk that the discussion itself would be held again. To prevent this to happen we gave the chairman clear instructions to ask supplementary questions to clarify the arguments of those days. Another weakness is the hampering recollections

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or recall bias. Fortunately there were more witnesses present who played an important role in the decades we studied to prevent this. The final weakness in our study is that only seven of eighteen invited participated. We are convinced that those who volunteered to the seminar were the main key players in the debate about prevention, which was confirmed during the seminar.

Chapter 4 is about a cross-sectional study with recent data of a representative population of GPs before and after the introduction of the module cardio-metabolic risk of the guideline Prevention Consultation. Because of the gender stratified sample the characteristics of our respondents in 2013 do not correspond perfectly with the characteristics of respondents in 2008 regarding age, gender and type of practice. We therefore adjusted for age, gender and type of practice in the comparison of the studies using multivariable logistic regressions. In this cross-sectional study we have to be modest about the results as well, for a selection bias can play a role. It is possible that GPs with more positive attitudes and working methods towards active prevention strategies in cardio-metabolic diseases and with more interest in selective prevention responded.¹⁴⁴ Another possible effect is a gender response bias. Oremus and Wolfson found that when a questionnaire was sent to 317 specialists in Canada, female sex was the only demographic variable that was found to be a predictor of specialist response to the postal questionnaire, which was higher for females.¹⁴⁵ In GPs, no difference in response was found between male and female GPs when 600 GPs in Wales received a postal questionnaire¹⁴⁴

In chapter 4 we studied attitudes and working methods concerning selective prevention. We asked about attitudes and working methods concerning prevention in the view of the module cardio-metabolic risk of the Prevention Consultation guideline, which makes it difficult to extrapolate our conclusions to prevention in general.

Conclusion

We conclude that the overrepresentation of women among the visitors in general practice actually reflects women at high risk for lifestyle related diseases, as we found that the consultation rate of smoking women is twice that of smoking men. Following this conclusion a gender-sensitive approach in prevention is necessary.

We conclude that several facilitators and barriers are present for the implementation of prevention in general practice. Financial and logistical support and the GPs' fear to lose the domain of prevention to other health care professionals are the main facilitators and insecurity about reimbursement and the lack of scientific evidence are the main barriers. After the publication of the module cardio-metabolic risk of the guideline Prevention Consultation more GPs actively invite

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patients to their practice for preventive measurements compared to before the publication, but less GPs reported that it is worthwhile to make an effort to detect patients at increased risk for cardiometabolic diseases.

Prevention by means of passive case-finding is applicable to women in general practice and there is less need for a proactive strategy in women compared to men, for women, especially those at risk, frequently visit their GP. The several points of action we found in women are applicable in daily practice to perform prevention by means of passive case-finding, but for the implementation of prevention the several barriers have to be taken into account.

Personal conclusion

During the process of writing my thesis I discovered that carrying out preventive actions during a consultation is a real possibility, and even rewarding. I learned to identify triggers to pose questions looking for future risks, and I learned how to motivate patients to change their habits and behaviour. Of course I don't always find the time to perform these actions. And not all my patients are willing to listen to, and to follow my advice. Sometimes because of the presence of severe psychosocial stress or because of other, more personal reasons. But still I find ways to let them know that I can guide them later, when they are ready for preventive actions.

The three female patients are fictional patients, but they present problems of real patients listed in my practice. I would like to end my discussion with a description how I respond nowadays to these patients, to demonstrate what I have changed in my routines with respect to preventive actions, during the process of writing my thesis.

Mrs A., the 21 year old female with asthma was prescribed new medication and received an advice to quit smoking. When I prescribed the new inhalator I asked her if she wanted to become pregnant in the near future, because the medication I prescribed is not fully safe during pregnancy. She told me that she was going to marry in six months and after the wedding she and her partner want to try to conceive. I explained that trying to conceive and smoking is not a good combination and explained her why, using motivational interviewing techniques. I advised both her and her partner to quit smoking, not only to conceive easier, but also for the health of the baby, and her and her partners' future health. I also invited her to make an appointment with me when she would plan to quit taking contraception.

After her wedding she and her husband made an appointment. They both quitted smoking. Because she was no longer short of breath I changed her medication to a safer combination during pregnancy and advised her to take folic acid and fill in a questionnaire about possible pregnancy

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risks ("Zwangerwijzer"). I advised her to send the results of this questionnaire to me and to make another appointment.

She was pregnant within two months, she and her husband still didn't smoke and she took folic acid in time. Her asthma was treated well and she reported no shortness of breath. No other risks appeared from the questionnaire.

Mrs B. was the 49 years old female who came for screening for cervical cancer. Taking her Pap smear turned out to be rather painful. I asked if she experienced hot flushes and other perimenopausal symptoms. She did, particularly the hot flushes, but didn't want to make an appointment for those complaints, because she didn't want to take hormones, like one of her friends did. I asked her if she smoked, which she confirmed. I asked about her pregnancies. She has two children and during the last pregnancy she had hypertension. Both her parents have hypertension and her mother suffered from a stroke when she was 62 years old.

I measured her blood pressure. It was 147/92 mm Hg. I invited her to come back in two weeks after she had been to the laboratory to measure her blood glucose and cholesterol levels. Her blood glucose level was 5.7 mmol/l, her total cholesterol level was 6.7 mmol/l, with a total cholesterol/HDL-ratio of 6.1. Her blood pressure was 142/89 mm Hg.

I explained to her that because of her age and the fact that she is not yet postmenopausal her actual 10 years risk for a cardiovascular disease is 3%, but the fact that she has hot flushes, smokes, has hypertension and had a pregnancy induced hypertension, hypercholesterolemia and a family history of cardiovascular disease will elevate her risk in the near future. I asked her if she wishes to change her lifestyle, now that she knows her risks. She confirms that she is motivated to lower her risk by changing her lifestyle and wants advice how to do that. She made an appointment with my practice nurse for smoking cessation and dietary advice and started to exercise.

One last question was about her sexual problems. She assured me that both she and her partner have no issues at this moment, that she and her partner can talk about it. She will ask him whether he would like to discuss this. Normally I could also ask for symptoms of urinary incontinence. But I have to be fair, I cannot ask all these questions in the time span of one consultation, so I postponed this question to another moment.

Mrs C. was the 84 years old female with multiple chronic disorders. In spite of all my actions to finetune glycemic control, her blood glucose levels even got higher. But it seems to worry me more than it worries her or her daughter.

One day her daughter e-mails me to visit her mother. She suffers from pains in her shoulders and hips again. Both my patient and her daughter agree with me that the focus on controlling

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diabetes has no effect on her quality of life. Moreover, it only frustrates them both. And she doesn't want to grow old 'no matter what'. She has told me on more than one occasion that if she doesn't wake up one morning that that is OK with her. So I shift the focus to quality of life, which means pain relief.

Like a few years ago, her symptoms could be caused by a polymyalgia rheumatica, which can be treated with prednisolone. I remember from an earlier episode that in spite of the blood glucose elevating effect of prednisolone, her blood glucose levels decreased, owing to the increased mobility. So in spite of the possible negative effects of this medication on her diabetes and thus future risks for cardiovascular disease, kidney disease and other complications we chose for treating her with prednisolone with the purpose of improving her quality of life.

Prevention has always been important to me as a GP. This focus on prevention motivated me for starting this research project in the first place. During the process of performing my research and writing this thesis I became much more aware of the windows of opportunity that present themselves in my practice for prevention, especially in women.

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Summary / samenvatting

Summary

Gender differences appear in lifestyle, the prevalence of risk factors, health problems, mortality, and access to medical care. Among visitors of general practice female patients outnumber male patients. This higher use of primary health care by women raises the question in what way women can be a target population for prevention in general practice, since they actually use primary health care services on such a regular basis.

Chapter 1 discusses the rationale and aims of the studies and introduces the research questions. Prevention of diseases caused by lifestyle related risk factors is a way to modulate the prevalence and severity of disease. Four classes of prevention programs can be identified: universal, selective, indicated and health care related prevention. Universal prevention strategies are designed to reach the entire population, which has not been identified on the basis of individual risks. Selective prevention strategies target subgroups of the general population that are determined to be at (high) risk. Indicated prevention interventions identify individuals who are not known with a certain disease but have risk factors or experience early signs. Health care related prevention targets individuals with a disease or multiple health problems. Prevention and health promotion are part of Dutch health care but agreements on who is responsible for the implementation and the attainment of prevention are often indistinct. From a preventive point of view general practitioners (GPs) are important health care professionals because they can reach many people for selective, indicative and health care related prevention. Actual rates of delivery of prevention activities by Dutch GPs, other than systematic influenza vaccination and cervical cancer screening, remain low, which raised the question whether the implementation of prevention programmes, for instance the prevention of cardiovascular disease, is sufficiently organized corresponding to the wishes and possibilities of GPs.

Unhealthy behaviour starts in childhood or adolescence and often progresses in later life. Young women are increasingly at risk of future health problems because of their current unhealthy behaviour. Middle aged women in general don't suffer from chronic diseases yet, but they often have several risk factors for coronary heart disease, cancer and osteoporosis after menopause. In later life the focus for prevention shifts from selected and indicated prevention to health care related prevention, pivotal to improve the quality of life because women have more disabilities than men and they also have a longer lifespan characterised by a poor self-rated health.

The primary aim of our research was to study whether the overrepresentation of women among the visitors in general practice actually reflects women at high risk for lifestyle related diseases and to find an answer to the question whether prevention programs in general practice should be gender sensitive. Secondly, we studied the barriers of implementation of prevention programs in GPs practices and what GPs need to successfully implement preventive actions into

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their daily practice. Thirdly we studied whether the GP gender affected attitudes and working methods concerning selective prevention. Lastly, our study aim was to find windows of opportunity for GPs to address lifestyle in female patients in order to implement prevention for women in all phases of life in general practice.

These study aims resulted into three research questions:

1. Whether and how do gender differences of both patients and GPs need to be taken into account when planning and implementing prevention programs?

2. What are facilitators and barriers in the implementation of prevention programs in general practice, and actual readiness of GPs to implement prevention?

3. What are windows of opportunity for prevention in different stages of life in women?

In **Chapter 2** we present the results of a cross-sectional study investigating whether gender plays a role in the relation between risk behaviour and use of GP services. The data used in this study originate from the Second Dutch National Survey of General Practice of 2000-2002. We studied smoking, alcohol abuse, excessive alcohol intake, use of soft drugs, overweight and insufficient physical exercise in relation to use of primary health care and gender in three age groups of men and women, young (18-22), middle-aged (45-49) and older (70-74). Almost all risk behaviours were more prevalent in men. Of all studied risk behaviours only smoking was related to yearly GP contact and consultation frequency in relation to gender. Smoking men consulted their GP significantly less frequently than non-smoking men, whereas in women the opposite was the case.

We conclude that preventive actions by means of case-finding in general practice, therefore, are more attainable in women than in men. This outcome may create a double setback for Dutch men, as smoking is a major cause of lower life expectancy in men.

Chapter 3 describes the results of a witness seminar that was held in 2011 to explore facilitators and barriers of the implementation of prevention in general practice in the Netherlands occurring during the past three decades. The participants, eight key-figures, discussed the decision-making process of the implementation of systematic prevention programs in the Netherlands, thereby adding new perspectives on past events.

The central questions that the participants were asked to answer were how the role in prevention by Dutch GPs came about and why many GPs still hesitate to incorporate large scale cardiovascular risk management (CVRM) programs into their daily practice, in order to find clues how to motivate professionals to adopt and implement prevention programmes.

The results show that there are four different transitional stages: 1. the conversion from GPs

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disputing prevention to the implementation of systematic influenza vaccination; 2. the transition from systematic influenza vaccination to planning CVRM programs; 3. the transition from planning and piloting CVRM programs to cancelling a large scale implementation of the CVRM program and 4. the reinforcement of prevention. The GPs' fear to lose the domain of prevention to other health care professionals and financial and logistical support are the main facilitators for implementing prevention programs in primary care. The main barriers for implementing prevention are the combination of insecurity about reimbursement and lack of scientific evidence. It appears that the ethical view of GPs that everyone should have the same right to obtain preventive care gradually takes over the inclination to hold on to evidence based prevention.

The aim of **chapter 4** is to compare attitudes and working methods of male and female Dutch GPs towards selective prevention of cardio-metabolic diseases before and after the introduction of the module cardio-metabolic risk of the Prevention Consultation guideline in 2011. We compared attitudes and working methods in a cross-sectional survey among Dutch GPs in 2013 to the results of a comparable study performed in 2008. The study showed that in 2013, more GPs report to actively invite patients for preventive measurements. However, less GPs report that it is worthwhile to make an effort to detect patients at increased risk for cardio-metabolic diseases, compared to 2008. In 2013, more male GPs actively invite patients for preventive measurements than female GPs. In 2013, more GPs suggested that prevention may be performed by other stakeholders compared to 2008. Financial support and evidence for prevention programs were mentioned as the main facilitators for prevention.

We conclude that GPs feel little need to fully implement the module cardio-metabolic risk, less GPs think it is worthwhile to make an effort to detect patients at increased risk and more GPs are willing to delegate preventive actions to other health institutions in 2013 compared to 2008. More male GPs than female GPs actively invite patients to visit the practice for preventive measurements. No gender differences were found comparing both strategies of active working methods together, i.e. when the GP invited patients for preventive measurements and invited patients for preventive measurements who came to the GPs' office for other complaints. Political choices concerning the remuneration of prevention have to be made in order to financially facilitate selective prevention in general practice.

Chapter 5 presents the results of a cross-sectional study to acquire knowledge on risk behaviour among young women, and the relation between risk behaviour and self-rated health (SRH) in order to focus prevention programs in general practice to improve the (future) health of young women aged 18-22 years old. Health interview data originate from the second Dutch National Survey of

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General Practice.

We found that 84% visited her general practitioner in the past year. Of the women, 13% rated her health as fair or poor. 34% smoked, 6% reported alcohol abuse, 7% used soft drugs and 35% reported insufficient physical exercise. Only smoking had a significantly negative effect on SRH, but adjusted for other risk factors no single risk factor had a significant effect on SRH. Clustering of risk factors was related to a lower SRH.

We conclude that an unhealthy lifestyle was common in young women. Risk behaviour has no effect on SRH unless risk factors clustered. Preventative health programs aimed at young women must not focus on current SRH but on future consequences of their lifestyle. Because of the high consultation frequency of young women the GP can play an indispensable, challenging key role in prevention.

In **chapter 6** the findings are shown of a cross-sectional study that aimed to assess the risk of women aged 45 - 49 years old for coronary heart disease (CHD) and osteoporosis and its relation with socioeconomic status (SES) and the access to GPs in order to provide clues for prevention in general practice, as part of the risks for CHD and osteoporosis in women are established by their lifestyle in the premenopausal period. Health interview data used for this study originated from the second Dutch National Survey of General Practice.

A total of 39% had an increased risk for developing CHD in the next 10 years, and 3% had a high risk. Of total of 22% had an increased risk for osteoporosis. We found a significant relation between SES and unhealthy lifestyle. An unhealthy lifestyle led to an increased or high risk for CHD, and a high osteoporosis risk. We did not find a significant relation between SES and GP consultation frequency.

We conclude that special attention is required for women with the lowest SES because they have an unhealthier lifestyle than do women with middle or the highest SES. Women at higher risk for CHD and osteoporosis consulted their GP in the same (high) frequency as did women at lower risk. This led us to the conclusion that the Dutch GP should therefore be a key player in the prevention of CHD and osteoporosis related to an unhealthy lifestyle in premenopausal women.

In **chapter 7** the relationship between the number of chronic diseases and SRH and effects of combinations of chronic conditions on SRH in elderly women aged 70 - 74 years old is described in order to establish the impact of multimorbidity and specific disease combinations on SRH. We used health interview data from the second Dutch National Survey of General Practice.

A large majority of 87% of the women reported one or more chronic condition. Women without any chronic condition rated their health significantly better than those with one or more

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chronic conditions. Either severe back pain or severe headache was included in the most prevalent combinations of two chronic conditions with a significantly higher negative impact on SRH than expected.

We conclude that all combinations including severe headache and some combinations including severe back pain and another chronic condition, have a significantly more negative impact on SRH in women aged 70 - 74 years old than expected. Taking into account that hidden pathology such as severe headache and severe back pain in combination with a chronic condition is a trigger for low SRH, GPs should be very alert on these conditions in older women to add to the quality of the later years of life.

Finally **chapter 8**, the general discussion of the thesis, presents an overview of the findings which are discussed above. We connect the separate studies, discuss implications for daily practice and formulate a conclusion.

The overrepresentation of women among the visitors in general practice actually reflects women at high risk for lifestyle related diseases, as we found that the consultation rate of smoking women is twice that of smoking men. Following this conclusion a gender-sensitive approach in prevention is necessary, leading to a different invitation strategy of men and women in general practice in prevention programs. In order to successfully implement prevention programmes the barriers GPs perceive have to be addressed and dealt with by the organisations of GPs, the health insurance companies and the local and central government. Prevention by means of passive case-finding is applicable to women in general practice and there is less need for a proactive strategy in women compared to men, for women, especially those at risk, frequently visit their GP. We identified several windows of opportunity for prevention in women: in young women contraception use, preconceptional advice and pregnancy related complications. In women over thirty cervical cancer screening, for middle aged women perimenopausal symptoms and at older age multimorbidity and polyfarmacy. These points of action are applicable in daily practice to perform prevention by means of passive case-finding. This can only be done when barriers of prevention, such as lack of time, financial reimbursement and insufficient scientific evidence are dealt with.

Samenvatting

Er bestaan genderverschillen in leefstijl, in de prevalentie van risico factoren, in gezondheidsproblemen, in mortaliteit en in de toegang tot de gezondheidszorg. Vrouwen bezoeken de huisartsenpraktijk vaker dan mannen. Dit hogere zorggebruik van vrouwen roept de vraag op of en hoe vrouwen een doelgroep kunnen zijn voor preventie in de huisartsenpraktijk.

Hoofdstuk 1 gaat over de achtergrond en het doel van de studies en introduceert de onderzoeksvragen. Door middel van preventie kunnen aandoeningen die veroorzaakt worden door leefstijl gerelateerde factoren worden voorkomen en kan de ernst van deze aandoeningen worden beïnvloed. Er zijn vier types preventie te onderscheiden: universele, selectieve, geïndiceerde en zorggerelateerde preventie. Universele preventie is gericht op de algemene bevolking die niet geselecteerd is op basis van een individuele risicofactor. Selectieve preventie is gericht op subgroepen waarbij het risico op het ontwikkelen van een probleem aanzienlijk groter is dan gemiddeld. Geïndiceerde preventie is gericht op individuen die niet bekend zijn met een bepaalde ziekte maar die wel risicofactoren hebben of al vroege symptomen ervaren. Zorggerelateerde preventie is gericht op mensen met een ziekte of met verschillende gezondheidsproblemen. Preventie en gezondheidsbevordering maken deel uit van de Nederlandse gezondheidszorg. Het is echter vaak onduidelijk wie verantwoordelijk is voor de implementatie en de uitvoering van preventie. De huisarts is een belangrijke zorgverlener vanuit preventief oogpunt omdat deze een groot bereik heeft onder patiënten ten behoeve van selectieve, geïndiceerde en zorggerelateerde preventie. Het daadwerkelijk uitvoeren van preventieve activiteiten door de Nederlandse huisarts, afgezien van de systematische griepvaccinatie en de screening voor baarmoederhalskanker, blijft laaq. Dit roept de vraag op in hoeverre bij de implementatie van preventieprogramma's, zoals de preventie van hart- en vaatziekten, voldoende rekening wordt gehouden met de wensen en mogelijkheden van huisartsen.

Een ongezonde leefstijl begint op kinderleeftijd of tijdens adolescentie en bestendigt zich vaak in het verdere leven. Jonge vrouwen lopen een groot risico op toekomstige gezondheidsproblemen vanwege hun huidige ongezonde gedrag. Op middelbare leeftijd hebben vrouwen over het algemeen nog geen chronische ziektes, maar ze hebben vaak al wel verschillende risico factoren om hart- en vaatziektes, kanker en osteoporose te krijgen. Op oudere leeftijd verschuift de focus voor preventie van selectieve en geïndiceerde preventie naar zorggerelateerde preventie. Omdat vrouwen meer beperkingen rapporteren dan mannen en omdat vrouwen langer leven met een als slechter ervaren gezondheid is zorggerelateerde preventie cruciaal om de kwaliteit van leven te verbeteren.

Het eerste doel van ons onderzoek was het bestuderen in hoeverre de

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oververtegenwoordiging van vrouwelijke bezoekers van de huisartsenpraktijk ook daadwerkelijk de groep weerspiegelt die een hoger risico loopt op leefstijlgerelateerde ziektes. We wilden zo een antwoord te vinden op de vraag of preventieprogramma's gender-sensitief moeten zijn. Ten tweede onderzochten we barrières bij de implementatie van preventieprogramma's in de huisartsenpraktijk en wat huisartsen nodig hebben om succesvol preventieve activiteiten te implementeren in hun dagelijkse praktijk. Verder onderzochten we in hoeverre het geslacht van de huisarts zelf van invloed is op de houding en werkwijzen ten aanzien van selectieve preventie. Tot slot was het doel om aangrijpingspunten te vinden om leefstijl bij vrouwelijke patiënten te adresseren om op deze manier preventie voor vrouwen in alle levensfasen te implementeren in de huisartsenpraktijk.

Deze doelen resulteerden in de volgende drie onderzoeksvragen:

1. In hoeverre moet rekening gehouden worden met gender van zowel de patiënt als de huisarts bij het plannen en implementeren van preventieprogramma's?

2. Wat zijn bevorderende factoren en wat zijn barrières bij de implementatie van preventieprogramma's in de huisartsenpraktijk en wat is de bereidheid van huisartsen om preventie te implementeren?

3. Wat zijn aangrijpingspunten voor preventie in de verschillende levensfasen van de vrouw?

In **hoofdstuk 2** worden de resultaten van een cross-sectioneel onderzoek gepresenteerd naar de vraag in hoeverre gender een rol speelt in de relatie tussen risicogedrag en het gebruik van huisartsenzorg. De gegevens die gebruikt zijn in deze studie zijn afkomstig uit de Tweede Nationale Studie naar ziekten en verrichtingen in de huisartsenpraktijk van 2000-2002. We bestudeerden de risicofactoren roken, alcohol misbruik, overmatig alcoholgebruik, het gebruik van soft drugs, overgewicht en onvoldoende lichaamsbeweging in relatie tot het gebruik van huisartsenzorg en gender in drie leeftijdsgroepen mannen en vrouwen: jong (18-22), middelbaar (45-49) en ouder (70-74). Bijna alle risicofactoren kwamen meer voor bij mannen. Van alle bestudeerde risicofactoren maakte gender bij alleen roken verschil uit in het hulpvraaggedrag bij de huisarts: rokende mannen consulteren hun huisarts namelijk significant minder vaak dan niet-rokende mannen, terwijl bij vrouwen het omgekeerde het geval was. Vrouwen zijn derhalve in de huisartsenpraktijk beter te bereiken voor preventieve acties door middel van case finding dan mannen. Deze uitkomst kan Nederlandse mannen op een dubbele achterstand plaatsen, aangezien roken een belangrijke oorzaak is voor de lagere levensverwachting van mannen.

Hoofdstuk 3 beschrijft de resultaten van een witness seminar, gehouden in 2011, waarbij de bevorderende en remmende factoren van de implementatie van preventie in de huisartsenpraktijk

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in Nederland in de afgelopen drie decennia werden besproken. De acht deelnemende sleutelfiguren bediscussieerden het besluitvormingsproces van de implementatie van systematische preventieprogramma's in Nederland. De centrale vragen die de deelnemers moesten beantwoorden waren hoe de rol van de Nederlandse huisarts in preventie zich heeft ontwikkeld en waarom nog steeds veel huisartsen twijfelen aan het invoeren van grootschalige preventieprogramma's op het gebied van cardiovasculair risicomanagement (CVRM) in de dagelijkse praktijk. Doel van het seminar was om aanwijzingen te vinden hoe professionals te motiveren om met preventieprogramma's in te stemmen en te implementeren.

De resultaten laten zien dat er vier verschillende transitie fasen te onderscheiden zijn: 1. de transitie van huisartsen die discussiëren over preventie naar de implementatie van de systematische influenza vaccinatie; 2. de transitie van de systematische influenza vaccinatie naar het plannen van CVRM programma's; 3. de transitie van het plannen en uittesten van CVRM programma's naar het afwijzen van een grootschalige implementatie van het CVRM programma en 4. de transitie in de vorm van de terugkeer en versterking van preventie. De angst van huisartsen om het domein van preventie te verliezen aan andere zorgverleners en financiële en logistieke steun zijn de belangrijkste bevorderende factoren voor de implementatie van preventie zijn de combinatie van onzekerheid over vergoeding en het gebrek aan wetenschappelijk bewijs. Het lijkt erop dat de ethische kijk van huisartsen dat iedereen hetzelfde recht heeft op preventie het geleidelijk overneemt van de neiging om vast te houden aan evidence based preventie.

In **hoofdstuk 4** onderzoeken we de houding en werkwijzen van mannelijke en vrouwelijke Nederlandse huisartsen ten aanzien van selectieve preventie van cardiometabole ziektes voor en na de introductie van de NHG-standaard Het PreventieConsult module cardiometabool risico in 2011. We vergeleken de houding en werkwijzen in een cross-sectioneel onderzoek bij in 2013 met de resultaten van een vergelijkbare studie uitgevoerd in 2008. In 2013 gaven meer huisartsen aan dat ze actief patiënten uitnodigen voor preventieve metingen. Minder huisartsen gaven echter aan het de moeite waard te vinden om mensen met een verhoogd risico op cardiometabole ziektes op te sporen, vergeleken met 2008. In 2013 gaven meer huisartsen aan dat preventieve activiteiten ook kunnen worden uitgevoerd buiten de huisartsenpraktijk vergeleken met 2008. Financiële vergoeding en wetenschappelijk bewijs voor preventie werden genoemd als de belangrijkste bevorderende factoren voor preventie. In 2013 nodigden meer mannelijke dan vrouwelijke huisartsen actief patiënten uit.

We concluderen dat huisartsen weinig noodzaak voelen om de module cardiometabool risico volledig te implementeren, dat minder huisartsen het de moeite waard vinden om patiënten

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met een verhoogd risico op cardiometabole ziektes op te sporen en dat meer huisartsen bereid zijn preventieve activiteiten te delegeren aan andere zorginstellingen in 2013 in vergelijking met 2008. Meer mannelijke dan vrouwelijke huisartsen roepen patiënten actief op voor preventieve metingen in de praktijk. Geen genderverschil werd gevonden wanneer beide actieve werkwijzen samen werden genomen, dus het actief oproepen van de patiënt voor preventieve metingen en het uitnodigen voor preventieve metingen van patiënten die om een andere reden bij de huisarts komen. Politieke keuzes ten aanzien van de financiering van preventie moeten gemaakt worden om selectieve preventie in de huisartsenpraktijk te faciliteren.

Hoofdstuk 5 presenteert de resultaten van een cross-sectioneel onderzoek gepresenteerd om kennis te verkrijgen over risicogedrag bij jonge vrouwen van 18-22 jaar oud, en de relatie tussen risicogedrag en de ervaren gezondheid. Het doel was om preventieprogramma's in de huisartsenpraktijk te kunnen focussen op de (toekomstige) gezondheid van jonge vrouwen. De gegevens die gebruikt zijn in deze studie zijn afkomstig uit de Tweede Nationale Studie naar ziekten en verrichtingen in de huisartsenpraktijk.

De resultaten laten zien dat 84% haar huisarts in het afgelopen jaar bezocht. Van hen beoordeelde 13% de gezondheid als matig of slecht. 34% rookte, 6% rapporteerde alcoholmisbruik, 7% gebruikte soft drugs en 35% rapporteerde onvoldoende lichamelijke inspanning. Alleen roken had een significant negatief effect op de ervaren gezondheid, maar gecorrigeerd voor andere risicofactoren had geen enkele risicofactor een significant effect op de ervaren gezondheid. Het clusteren van risicofactoren was gerelateerd aan een lagere ervaren gezondheid.

We concluderen dat een ongezonde leefstijl veel voorkomt bij jonge vrouwen. Risicogedrag heeft geen invloed op de ervaren gezondheid tenzij risicofactoren geclusterd zijn. We concluderen dat preventieve gezondheidsprogramma's gericht op jonge vrouwen dus niet gefocust moeten worden op de huidige ervaren gezondheid maar op de toekomstige consequenties van hun leefstijl. Vanwege de hoge consultfrequentie van jonge vrouwen kan de huisarts een onmisbare, uitdagende rol spelen in preventie bij jonge vrouwen.

In **hoofdstuk 6** worden de resultaten beschreven van een cross-sectioneel onderzoek naar het risico op coronaire hartziektes en osteoporose bij vrouwen van 45 - 49 jaar oud en de relatie met de sociaaleconomische status (SES) en de toegang tot de huisarts. Het doel was om aangrijpingspunten voor preventie in de huisartsenpraktijk te verkrijgen. Een deel van de risico's op coronaire hartziektes en osteoporose bij vrouwen wordt veroorzaakt door hun leefstijl in de premenopauzale periode. Gegevens uit gezondheidsinterviews uit de Tweede Nationale Studie naar ziekten en verrichtingen in de huisartsenpraktijk zijn gebruikt voor deze studie.

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In totaal had 39% een verhoogd risico op het ontwikkelen van een coronaire hartziekte in de komende tien jaar, en 3% had een hoog risico. In totaal had 22% een verhoogd risico op osteoporose. We vonden een significante relatie tussen SES en een ongezonde leefstijl. Een ongezonde leefstijl leidde tot een verhoogd risico of hoog risico op een coronaire hart ziekte en een verhoogd risico op osteoporose. Er was geen significante relatie tussen SES en consultfrequentie bij de huisarts.

We concluderen dat speciale aandacht vereist is voor vrouwen met de laagste SES omdat zij een ongezondere leefstijl hebben dan vrouwen met een hogere SES. Vrouwen met een hoger risico op coronaire hartziektes en osteoporose consulteren hun huisarts met de zelfde (hoge) frequentie als vrouwen met een lager risico. De Nederlandse huisarts kan een hoofdrol spelen in de preventie van coronaire hartziektes en osteoporose gerelateerd aan een ongezonde leefstijl bij premenopauzale vrouwen.

In **hoofdstuk 7** beschrijven we de relatie tussen het aantal chronische ziektes en de ervaren gezondheid en effecten van combinaties van chronische aandoeningen op de ervaren gezondheid bij oudere vrouwen van 70-74 jaar oud. We beogen de impact van multimorbiditeit en specifieke combinaties van ziektes op de ervaren gezondheid vast te stellen. We gebruikten gegevens van gezondheidsinterviews uit de Tweede Nationale Studie naar ziekten en verrichtingen in de huisartsenpraktijk.

Een grote meerderheid (87%) van de vrouwen rapporteerde één of meer chronische aandoeningen. Vrouwen zonder een chronische aandoening beoordeelden hun gezondheid significant beter dan de vrouwen met één of meer chronische aandoeningen. Alle combinaties met ernstige hoofdpijn en verschillende combinaties met ernstige rugpijn en een andere chronische aandoening hadden een significant grotere negatieve impact op de ervaren gezondheid dan verwacht in vergelijking met andere vrouwen met twee aandoeningen.

We concluderen dat ernstige hoofdpijn en ernstige rugpijn in combinatie met een chronische aandoening een trigger is voor een als minder goed ervaren gezondheid. Huisartsen moeten dus zeer alert zijn op deze vaak verborgen aandoeningen bij oudere vrouwen om zo een bijdrage te leveren aan de kwaliteit van het verdere leven.

Tot slot wordt in **hoofdstuk 8**, de algemene discussie, een overzicht gegeven van de bevindingen die in de verschillende studies aan de orde zijn gekomen. Ze worden met elkaar in verband gebracht en we bespreken de implicaties voor de dagelijkse praktijk en formuleren een conclusie.

De oververtegenwoordiging van vrouwen onder de bezoekers van de huisartsenpraktijk weerspiegelt inderdaad de groep vrouwen met een hoog risico op leefstijl gerelateerde ziektes: de

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consultfrequentie van rokende vrouwen is twee maal zo hoog als die van rokende mannen. We vinden een gender-sensitieve aanpak van preventie noodzakelijk, resulterend in een verschillende strategie bij het uitnodigen van mannen en vrouwen in de huisartsenpraktijk voor preventie programma's. Om preventieprogramma's succesvol te implementeren moeten de barrières die huisartsen ervaren worden opgepakt door de huisartsenorganisaties, de zorgverzekeraars en de lokale en centrale overheid. Preventie door middel van passieve case finding is toepasbaar bij vrouwen in de huisartsenpraktijk en er bestaat minder noodzaak voor een proactieve strategie bij vrouwen vergeleken met mannen, omdat vrouwen, en in het bijzonder zij die een hoog risico lopen, frequent hun huisarts consulteren. Verschillende aangrijpingspunten voor preventie bij vrouwen zijn mogelijk: bij jonge vrouwen het gebruik van anticonceptie, preconceptie advies en zwangerschapsgerelateerde complicaties. Bij vrouwen boven de dertig is een aangrijpingspunt de screening naar baarmoederhalskanker, voor vrouwen van middelbare leeftijd de perimenopauzale klachten en op oudere leeftijd de multimorbiditeit en de daarmee samenhangende polyfarmacie. Deze aangrijpingspunten zijn toepasbaar om in de dagelijkse praktijk preventie uit te voeren door middel van passieve case finding. Dit kan echter alleen maar gerealiseerd worden als barrières voor preventie, zoals tijdgebrek, financiële vergoeding en onvoldoende wetenschappelijk bewijs, worden aangepakt.

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Curriculum Vitae

Hedwig Vos werd als oudste van vier kinderen op 6 oktober 1972 geboren in het Friese Smallingerland. In 1991 behaalde zij het Atheneumdiploma aan het Groen van Prinsterercollege te Den haag. In 1992 begon zij aan de studie geneeskunde aan de Universiteit Leiden. Tijdens haar studie was ze lid van het bestuur van de MFLS, de studievereniging van de Medische faculteit. Ook is zij studentlid geweest van het Faculteitsbestuur en daarna lid van de Faculteitsraad. In 1999 behaalde zij haar arts-examen en ging vervolgens werken als arts-assistent Heelkunde in de Reinier de Graafgroep, lokatie Voorburg. In 2000 volgde zij een traineeship van een jaar in de bedrijfs- en verzekeringsgeneeskunde bij WOSM. In 2001 begon zij aan de huisartsenopleiding in Leiden (LUMC), met huisartsenstages in Naaldwijk en Den Haag. Tijdens de huisartsenopleiding behaalde ze de applicatiecursus als consultatiebureauarts en deed ze ervaring op bij de acute dienst ("crisisdienst") van de GGZ-instelling Parnassia. Toen ze in 2003 als Huisarts in dienst van een huisarts (HidHa) ging werken heeft ze dit nog enkele jaren gecombineerd met het werk als consultatiebureauarts en arts bij de acute dienst van Parnassia. In 2007 heeft ze samen met haar duo-collega Nicoline Pes-Veenstra een nieuwe huisartsenpraktijk opgericht in de Haagse wijk Rustenburg-Oostbroek, waar zij nu nog steeds werkt. Sinds 2013 is zij huisartsenopleider.

Tijdens de huisartsenopleiding was zij van 2001 tot en met 2003 lid van het bestuur van de LOVAH (Landelijk Overleg van Aspirant Huisartsen). Van 2004 tot en met 2007 was zij lid van het dagelijks bestuur van de VNVA (Vereniging Nederlandse Vrouwelijke Artsen). Vanaf maart 2006 was zij een periode van vier jaar lid van de Haagse gemeenteraad voor de Partij van de Arbeid. Momenteel is zij voorzitter van het bestuur van stichting Yasmin, een Haags participatiecentrum voor vrouwen, is zij lid van de Raad van Toezicht en van de werkgroep vrouwen en huisartsgeneeskunde van het Nederlands Huisartsengenootschap, lid van de vergadering van afgevaardigden van de Beroepspensioenvereniging van het huisartsenpensioenfonds en sinds januari 2014 lid van het bestuur van de Huisartsenkring Haaglanden en daardoor ook lid van de ledenraad van de Landelijke Huisartsenvereniging.

In 2005 begon zij aan de Radboud Universiteit in Nijmegen met haar onderzoek naar de gezondheid en risicofactoren bij vrouwen in drie leeftijdsgroepen. Dit onderzoek resulteerde uiteindelijk in dit proefschrift.

Hedwig Vos is getrouwd met Werner Hoffmans en zij hebben twee zonen: David (2009) en Wessel (2011).

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Risk factors in women's health in different stages of life

