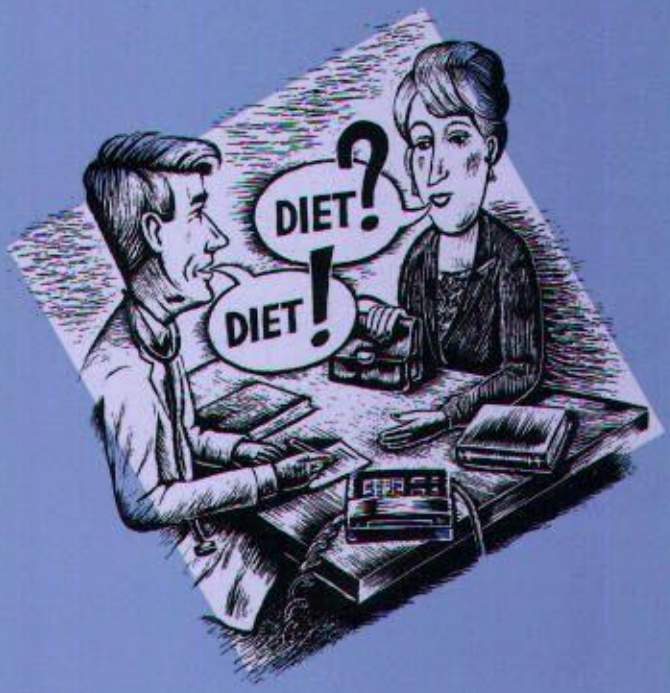
Determinants of Nutrition Guidance Practices of Primary-Care Physicians

Gert Jan Hiddink



Stellingen

1. De huisarts neemt temidden van de belangrijkste voedingsinformatiebronnen van de consument een unieke positie in vanwege de hoge graad van raadpleging door consumenten , de hoge gepercipieerde deskundigheid en het bereik van bijna alle segmenten van de populatie.
   dit proefschrift

2. Teneinde de effectiviteit van voedingsvoorlichting gericht op huisartsen verder te vergroten, dient het wetenschappelijk onderzoek naar determinanten van voedings-voorlichtingsgedragingen van huisartsen krachtig verder ontwikkeld te worden.
   dit proefschrift

3. Ondanks het feit dat huisartsen barrières percipiëren bij voedingsvoorlichting aan patiënten, verkeren ze toch in een veelbelovende positie om actief te zijn op het gebied van de voedingsvoorlichting.
   dit proefschrift

4. Teneinde een goed inzicht te verkrijgen in het werkingsmechanisme van determinanten van voedingsvoorlichtingsgedragingen van huisartsen verdient het ten zeerste aanbeveling om additioneel aan een multiple regressie analyse ook een LISREL-analyse van determinanten uit te voeren.
   dit proefschrift

5. De stelling van Kanuk en Berenson dat er geen sterke empirische aanwijzingen zijn voor de effectiviteit van methoden om de respons van schriftelijke enquêtes te verhogen, behalve voor de follow-up en het gebruik van financiële 'incentives', is nog steeds geldig.
   Kanuk,L & Berenson,C., Journal of Marketing Research, 1975, 12: 440 -453

6. Huisartsen dienen relevante kennis en praktische vaardigheden te hebben op het gebied van de voedingswetenschap en de voorlichtingskunde, zodat ze patiënten optimale voedingsvoorlichting kunnen geven.

7. Niet alle door huisartsen gegeven adviezen zijn wetenschappelijk onderbouwd.
Meyman,F.J. Huisarts Wet 1996; 39: 61-68

8. 'Social support' is niet alleen belangrijk voor het doorvoeren van gedragsverandering en de handhaving daarvan door anderen; het scheelt ook een slok op een borrel bij het schrijven van een proefschrift.

9. Een netwerk van vrienden kan een partner niet vervangen.
De Volkskrant, p. 13, 30 december 1995 : Peter Giesen, Een kwestie van geluk

10. Het aantal lintjes ter gelegenheid van Koninginnedag leek in dubbel opzicht op de neerslag dit jaar: minder, maar met enthousiasme ontvangen.

11. Het wereldrecord op de marathon (Belayneh Densamo, Rotterdam 1988: 2 uur, 6 minuten en 50 seconden) zal niet voor het jaar 2000 worden verbeterd.

12. Indien de KNVB zijn plannen met betrekking tot het voetbalnet doorzet, verdient het serieuze overweging de clubs in het betaalde voetbal te laten meebetalen aan de handhaving van de openbare orde op stations en rond de stadions.

13. De volgende Elfstedentocht gaat door.

Stellingen behorend bij het proefschrift

Determinants of nutrition guidance practices
of primary-care physicians

Gert Jan Hiddink
Wageningen, 18 juni 1996

DETERMINANTS OF NUTRITION GUIDANCE PRACTICES OF PRIMARY-CARE PHYSICIANS

Gert Jan Hiddink

Promotoren: Dr. J.G.A.J. Hautvast
Hoogleraar in de leer van de voeding en de voedselbereiding

Dr. C.M.J. van Woerkum
Hoogleraar in de voorlichtingskunde

DETERMINANTS OF NUTRITION GUIDANCE PRACTICES OF PRIMARY-CARE PHYSICIANS

Gerrit Jan Hiddink

Proefschrift
ter verkrijging van de graad van doctor
in de landbouw- en milieuwetenschappen,
op gezag van de rector magnificus,
dr. C.M. Karssen,
in het openbaar te verdedigen
op dinsdag 18 juni 1996
des namiddags om half twee in de Aula
van de Landbouwuniversiteit te Wageningen

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ABSTRACT

DETERMINANTS OF NUTRITION GUIDANCE PRACTICES
OF PRIMARY-CARE PHYSICIANS

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18th June 1996

The aim of the studies described in this thesis was to analyze nutrition guidance practices of primary-care physicians (PCPs), their nutritional attitudes and knowledge and their interest in the role of nutrition in health and disease. A second objective was to identify the determinants of nutrition guidance practices as well as their working mechanism. In addition one study is described, on consumers expectations of such nutrition guidance.

The consumer study revealed that PCPs appeared to be in a unique position over the dietician and Food and Nutrition Education Bureau, because of the high referral score, the high perceived expertise and the reach of nearly all segments of the population.

A specifically developed questionnaire was sent to a nationwide random sample of 1000 PCPs in the Netherlands, in practice for between 5 and 15 years. The net response rate was 64%.

The most important perceived barriers of PCPs towards nutrition guidance were: a lack of nutrition training, lack of time to address nutrition issues and the perception that patients lack motivation to change lifestyle and/or dietary patterns. Driving forces in PCPs are: an active interest in the effect of nutrition in health and disease, a basic level of nutritional knowledge and positive attitudes towards nutrition guidance practices.

A postulated model on the working-mechanism of determinants of nutrition guidance practices of PCPs could be confirmed, using LISREL-analysis methodology. The predisposing factors, driving forces and perceived barriers in this model were identified. If solely multiple regression analysis (MRA) had been used to ascertain determinants in stead of both MRA and LISREL-analysis, this would have led to a missing of important predisposing factors and of 'hidden' intermediary factors and therefore to an incomplete understanding of the mechanism of action.

Policies to improve nutrition guidance practices of PCPs might in future benefit from a LISREL-analysis of determinants of these practices to become more effective.

CONTENTS

Chapter 1

General Introduction

GENERAL INTRODUCTION

Background

In the western world nutritional factors are of growing importance in the development of the major diseases of significance to public health. This fact requires that the medical profession should have both a working knowledge of the link between nutrient intake and illness and skills to provide dietary treatment to patients if needed. This thesis describes several studies in primary-care physicians on determinants (both perceived barriers as well as driving forces) of providing nutrition guidance to their patients. In addition one study describes the consumer expectations of such nutrition guidance.

This introduction gives a brief overview of the few studies so far carried out in primary - care physicians and their involvement in nutrition practices. This information combined with theoretical considerations[1] made it possible to postulate during the research process a working model of the action of determinants of nutrition guidance practices of primary-care physicians (PCPs). This is followed by a rationale of the studies, the design of the studies and an outline of the thesis.

Nutrition and primary-care physicians (PCPs)

a. Physicians as source of nutrition information

Physicians are perceived as the best source of health information, the most credible source, and after the media the source most often used[2-6]. Are PCPs also perceived as the best and most credible source of nutrition information? Literature indicates that in the United States the PCP is a very important source of nutrition information of the public[7-10]. A recent survey (1990) of The American Dietetic Association and The International Food Information Council[7] showed that the American public looks to physicians and dieticians

as the most useful sources of information about nutrition and cite physicians four times as often as dieticians. American adults interviewed for the 1991 Prevention Index[8] ranked newspapers and magazines as the most common source of nutrition information (37%), followed by people they know (29%), television and radio (16%), food labels and advertisements (6%) and physicians and nutritionists (4%). Although adults cite the media as the most common source of nutrition information[7-10], they consider health professionals, particularly physicians, the most accurate[9,10]. The PCP is an authoritative and trustful source[6] and he (or she) knows the situation of the patient[6], because of the continuity of care[11]. In one year 70% of the patients visit the PCP at least once, in three years this figure is 90-95%[6,12]. In 14-28% of patients' consultations of PCPs diet comes up for discussion[13-15], the initiative being evenly divided between physician and patient[14].

b. Research on PCPs practices, beliefs and attitudes

There is a paucity of research describing the nutritional attitudes, beliefs and practices of PCPs. This is surprising because of the important role nutrition plays in health and disease and because the PCP is being perceived as a very important nutrition information source. In addition, the nutrition guidance given by the PCP aiming at dietary change serves both prevention and treatment of a broad spectrum of chronic diseases and risk factors. A nutritionally sound advice may help the patients for the better, an advice which is not nutritionally sound will be ineffective or even in some cases makes the situation worsening. The research published on this subject in the period 1980- mid 1992 (the fieldwork of our studies started medio October 1992) will be discussed below; key figures and data (year of publication, authors, referencenumber, number of respondents, net response rate, aim of the study) are summarized in Table 1 (page 6,7,8). The more recent literature has been assimilated in the different Chapters of this thesis. In the given time-period, there are only a few studies which concentrate on nutrition [13,19,22,31-35,62]. The research on nutritional attitudes,

beliefs and practices is mostly embedded in research on attitudes, beliefs and practices to health promotion and disease prevention (Table 1, page 6,7,8). After an overview of the studies of Table 1, the studies are discussed and conclusions are formulated. Unless stated otherwise, the studies of Table 1 are carried out as mailsurveys.

Roughly, the research can be devided in three periods. The first period (about 1980 to 1984) in general can be characterized with the word 'fragmented'. In this period, attitudes and beliefs towards health promotion and disease prevention are addressed. Also the taskperception of PCPs gets attention. The research regards miscellaneous health promotion behaviours, including some nutritional behaviours (e.g. controlling obesity and counselling on weight). Barriers of PCPs towards these behaviours are not subject of research in a planned way.

In the second period (roughly 1984 to 1991), the picture becomes less fragmented. Also in this period attitudes and beliefs towards health promotion and disease prevention are addressed, but they are better defined now. In addition also the definition of task perception of PCPs is in most cases improved. Further the behaviours become better defined and more specific. A new phenomenon is that barriers to nutrition guidance are subject of research in this period. Finally, in general the sampling seems to be better than in the first period: there are more articles based on nationwide or US statewide samples.

The third period, starting around 1991, is characterized by a further improvement of the measurement of attitudes and beliefs. In this period also consistently task perception of PCPs is addressed. The range of subjects becomes at the same time wider and more specific in nutrition e.g. PCPs, practices towards high serumcholesterol levels[32], nutrition information needs[13] and nutrition opinions[62] of New Zealand GPs, nutrition education practices and opinions of Alberta family physicians[33] and on physicians counselling behaviours for common nutrition patterns in Canada[34]. In addition to barriers to nutrition guidance, also some positive influences are found.

Table 1 Research on attitudes, beliefs and professional practices of primary-care physicians

Year	Authors (ref.)	Sample of physicians	Number of respon-dents	Net response rate	Aim of the Study
1980	Daly et al[19]	representative sample of 346 Irish general practitioners	295	73%	to study attitudes to preventive medicine, beliefs concerning CHD risk factors and nutrition guidance
1980	Wyshak et al[16]	random sample of Massachusetts physicians (462) and lawyers (500)	 323 335	 70% 67%	pilot study to obtain a profile of health promoting behaviours of physicians and lawyers (including dietary habits and drinking behaviour)
1983	Wechsler et al[17]	representative sample of PCPs in Massachusetts	433	75%	study of health promotion beliefs, attitudes and practices of Massachusetts PCPs
1984	Catford & Nutbeam[18]	random sample of 214 GPs in Wessex	183	90%	To study attitude and behaviour in preventive medicine (smoking, accident prevention, promoting exercise, controlling obesity and hypertension)
1984	Rosen et al[20]	74 PCPs in group practices			feasibility study in primary-care, to develop and test a clinical model of preventive health services, including patient education, as an insurance benefit
1984	Wells et al[21]	random sample of 201 male members of a country medical society in selected specialities	151	76%	to study physicians' health habits and counselling practices on smoking, weight, exercise and alcohol
1984	Kottke et al[22]	random sample of 64 PCPs in private practice	49	77%	to study attitudes and activities in nutrition counselling in private practice
1985	McAllister et al[23]	random sample of about 1000 Texas PCPs	442	25% GPs 60% family practitioners 39% internists	to determine the level of interest in preventive medicine and health promotion
1985	Orleans et al[24]	national random sample of US 610 family practitioners	350	57%	to study treatment and referrals family practitioners provide for three behavioural health risks cigarette smoking, obesity and insufficient exercise - and on obstacles to office-based health promotion

Year	Authors (ref.)	Sample of physicians	Number of respon-dents	Net response rate	Aim of the Study
1985	Sobal et al[26]	random sample of 1040 PCPs in Maryland		65%	to study PCPs beliefs about the importance of 25 behaviours for promoting the health of the average person (9 nutrition behaviours)
1986	Valente et al[25]				to study the health promotion beliefs, attitudes and practices of PCPs
1987	Henry et al[29]	random sample of 430 family practice physicians in Michigan	278	65%	to determine what preventive medicine activities physicians practice, correlations between personal health practices or beliefs and professional practices, and to identify perceived barriers to these practices
1987	Verhaak and De Vries[30]	random sample of 900 Dutch PCPs	522	58%	to study attitudes, beliefs, taskperception and professional behaviour in preventive medicine.
1987 1991	Schucker et al[31] } Schucker et al[32] }	national random sample of physicians (general physicians, family practitioners, internists and cardiologists) — 1983:1277, 1986:1610, 1990:1604		47% 52% 54%	to assess attitudes and practices regarding high serum cholesterol levels
1990	Worsley & Worsley[13]	random sample of 1000 New Zealand GPs		78%	to study the nutrition information needs of New Zealand GPs
1990	Kelly & Joffres[33]	random sample of 532 family physicians in Alberta, Canada	255	53%	to study nutrition education practices and opinions of Alberta family physicians
1990	Waisman & Sauve[34]	random sample of 180 Calgary family physician (face-to-face interviews)	71	45%	to study physician counselling behaviours for common nutrition problems
1991	Langseth & Gemson[35]	US nationwide random sample of office-based PCPs	464	31%	to determine sources of nutrition information used by PCPs, attitudes and beliefs about nutrition in medicine, and counselling referrals
1991	Worsley & Worsley[62]	random sample of 1000 New Zealand GPs	252	78%	to study the attitudes and opinions on nutrition of New Zealand GPs (including the role of government in nutrition promotion)
1993	Levine et al[47]	nationwide random sample of 30.000 PCPs	3416	11%	to determine the degree to which PCPs practice the 'core competencies' in clinical nutrition identified by Young et al (Am J Clin Nutr 1983;38:800-810)

Year	Authors (ref.)	Sample of physicians	Number of respon-dents	Net response rate	Aim of the Study
1993	Lazarus et al[48]	seven faculty members and nine residents			to determine the effects of a nutrition education program provided by a physician nutrition specialist in a family-practice residency program
1995	Stostich et al[50]	random nationwide sample of 500 family physicians	237	49%	to determine the level of agreement between family physicians and the nutritional counselling recommendations of the US Preventive Services Task Force
1995	Glanz et al[49]	entire membership of Society of General Internal Medicine (N=1897)	960	53%	to examine the nutrition related practices and office services of PCPs and their preferred nutrition topics and educational methods
1993	Ammerman et al[51]	60 residents and attending physi-cians in a general medicine clinic		100%	to examine the relationship of dietary knowledge, attitudes, beliefs, organizational barriers and treatment practices for cholesterol management

First period.

The first period in general can be characterized by fragmentism. Most research pays attention to attitudes and beliefs towards health promotion and disease prevention, but the subjects of the studies differ enormously. Often also the task perception of the PCPs is addressed. Sometimes also behaviour is subject of research, but the behaviours are not always well defined. Often, the measurement of attitudes, beliefs, taskperception and also behaviour is based on solely one question. In addition, sometimes statements are given which are not based on empirical research. From a scientific point of view this period is clearly the pioneering period.

a) attitudes and beliefs of PCPs.

Daly et al[19] reported in 1980 on attitudes and behaviour to aspects of preventive medicine in a representative sample of Irish general practitioners. GPs were asked about their attitudes to preventive medicine, their beliefs concerning risk factors and prevention of coronary heart disease and their practice as regards non-pharmacological intervention to modify such risk factors, in particular diet, exercise and smoking. The net response rate was 73%. At that time, 37% of respondents did not consider elevated cholesterol as important with regard to coronary heart disease and only a minority believed in the importance of diet. 'Clearly, the diet-lipid controversy is far from resolved among these doctors', commented the authors. Most doctors were aware that dietary management is difficult.

Wechsler et al (1983)[17] examined the health-promotion beliefs, attitudes and practices of a representative sample of PCPs in Massachusetts[17]. Thirty-five percent of the 433 respondents (net-response-rate 75%) expressed a high level of confidence in dealing with behaviour change or diet. About 7% believed they were very successful in helping patients to achieve a change in the diet. This was in line with the general picture: 3 to 8% of the respondents thought that they were very successful in helping patients achieve changes in behaviour and

40-57% did think they were at least 'somewhat successful' in one or more areas.

Catford and Nutbeam reported in 1984[18] on Wessex general practitioners (GPs') attitude and behaviour towards smoking, accident prevention, promoting exercise and controlling obesity and hypertension. This research delivered a very high net-response rate (90%). The respondents recognized their key role in health promotion and health education (e.g. obesity control: 88%) and their shared responsibility with other professionals.

Rosen et al[20] reported in 1984 on the Insure-project 'Lifecycle Preventive Health services. This is a 3-year feasibility study in primary-care, to develop and test a clinical model of preventive health services, including patient education, as an insurance benefit.

The physicians are not optimistic about their success in getting their patients to follow their recommendations. They tend to have doubts about their own efficacy in these areas. In the fields of overweight, elevated blood cholesterol and poor eating patterns, 27-38% of respondents classified themselves as 'not effective', 58-66% as 'somewhat effective' and 4-12% as 'very effective'. The physicians expressed contradictory attitudes about prevention. They believe physicians should spend more time in providing preventive services but also believe that the lack of insurance reimbursement is an obstacle to providing these services.

b) task perception of PCPs.

The comprehensive studies of Wechsler et al[17] and Catford and Nutbeam[18] indicate that physicians believe that health promotion is important and that they as physicians can play and do play a significant role.

Daly et al[19] stated that their results indicate that GPs were willing to offer advice to their patients on some aspects of lifestyle and behaviour.

The task perception in the studies cited under a) was not based on prior qualitative research. In most cases it was measured with only one question. The format of the question made social desirable answers quite possible. In addition, it did not deal with parts of the task.

c) behaviour of PCPs.

Wells et al (1984)[21] carried out a study of physicians' health habits and counselling practices on smoking, weight, exercise and alcohol. A random sample of 201 male members of a country medical society in selected specialties (family and general practitioners, internists and surgeons, and obstetricians-gynaecologists) delivered 151 respondents (net response rate 76%). Three characteristics of physicians - clinical specialty, beliefs about counselling, and personal health habits - strongly influenced physicians' practices in counselling patients about health habits. Only 25% to 55% of physicians counselled a high percentage of all patients with poor habits (for weight this figure is 55%). About one third of physicians only counselled patients who have already diseases associated with the habits (for weight: 29%)[21].
Catford and Nutbeam[18] reported that many GPs had made progress in smoking prevention and control of obesity and hypertension. The authors believe that further progress is dependent on better training of GPs, on developing information systems which can be used and are effective in health promotion in practice and on strengthening the team approach in primary-care (by extending the role of the health visitor and the practice nurse).
Rosen et al[20] concluded that PCPs tend to be conscientious in educating their patients about their health risks, although they spend little time in patient education.

Finally, in this period Wyshak et al[16] reported in 1980 on the personal health promoting behaviours of Massachusetts physicians and lawyers.
These personal behaviours included dietary habits, physical activity, safety and accidents precautions, sleeping habits, smoking habits and drinking behaviour. Physicians seemed to be more concerned than lawyers with personal health promoting behaviours.

In conclusion, the best characterization of the first period is fragmentation and pioneering. Attitudes and beliefs, as well as task perception of PCPs are addressed. Scientifically there is

much room for improvement of methods. The research in this period in general does not give answers to nutrition guidance practice-questions and it is not specific enough. The behaviours are also not precisely defined. Barriers of PCPs to nutrition guidance are not addressed in this period in a planned way.

Second period.

In the second period (roughly 1984 to 1991), in addition to attitudes and beliefs, taskperception and practices of PCPs, barriers to nutrition guidance are subject of research (e.g. Kottke et al, 1984[22] and Orleans et al, 1985[24]). Also in this period the behaviours under study become better defined and more specific. The research in this period delivered more articles based on nationwide (Orleans et al, 1985[24]) or statewide (Valente et al, 1986[25]) samples.

a) attitudes and beliefs of PCPs.

Valente et al (1986)[25] reported that almost all respondents (97%) to a survey of 1040 primary-care physicians in Maryland (response rate 65%) believed they should modify patients' behaviour to minimize risk factors. Most PCPs believed they were prepared to counsel patients, but only a small percentage (3-18%) reported being very successful in helping patients achieve behavioural change. However, given appropriate support, physicians reported that they could be up to six times more successful (dieting and salt restriction both two times more successful, other nutritional areas four times more successful). Appropriate support was defined as referral information, literature for distribution to patients, physician education in behaviour modification and reprinted risk factor questionnaires. The result of this study indicate that PCPs have strong beliefs and interest in health promotion, are interested in continuing education about health promotion topics, and desire a variety of new skills to help modify their health behaviours. In the same survey of 1040 PCPs in Maryland[25], Sobal et al (1985)[26] examined their beliefs about the importance of 25 behaviours

for promoting the health of the average person. Eliminating smoking was considered most important and taking vitamin supplements least important. Six out of nine nutritional health behaviours were considered to be more important than the mean of importance of all 25 behaviours[26].

McAllister et al (1985)[23] surveyed a random sample of about 1000 Texas PCPs to determine their level of interest in preventive medicine and health promotion (net response rates for GPs and internists very low) (Table 1).. Nutrition, stress and smoking were the risk areas most frequently desired as offerings in CME (continuing medical education).

In the late eighties, it was reported that PCPs were not aware of the extent to which patients value lifestyle advices[24] and that PCPs underestimated the interest of patients in receiving health education[27]. Patients are of the opinion that PCPs should show more interest in their lifestyle[22,28]. The Medical Research Council's general practice research framework study on lifestyle and health[28] (Are general practitioners doing enough to promote healthy lifestyle?) included information on dieting and weight. Completed questionnaires were received from 25.496 men and 36.657 women registered with 47 group practices in England and Scotland. Sixty-seven % of the responding patients thought that their general practitioner should be more interested in their weight. Twenty-four % of the responding women could recall having received relevant advice regarding their weight. The results of this study in general suggest that patients are concerned about their lifestyle, that most would welcome relevant counselling, and that doctors should become more concerned with prevention of this kind[28].

Verhaak and De Vries[30] reported in 1987 on attitudes, beliefs and taskperception in preventive medicine in a random sample of 900 Dutch PCPs (net response rate 58%). The majority of respondents considers primary and secondary prevention as a task and a responsibility of the PCP. However, respondents are pessimistic about the feasibility of preventive medicine activities in their own practice: the PCP does not have the data, his practice-organisation is

not appropriate for this task and he does not have therapeutical possibilities for follow up[30].

b) taskperception of PCPs.

Kottke et al (1984)[22] surveyed a random sample of 64 PCPs in private practice (response rate 77%) and concluded that respondents consider it appropriate to give nutritional advice to patients who are not necessarily seeking it.

Also in the other studies cited under a) PCPs had a positive taskperception.

However, the same critical remarks can be made as in the first period: task perception was not based on prior qualitative research, mostly it was asked with only one question, and in such a format that social desirable answers were quite possible. Also, it did not dealt with parts of the task.

c) behaviours of PCPs.

Orleans et al (1985)[24] in their national study of US family practitioners concluded that PCPs are somewhat reluctant to treat problems as cigarette smoking, obesity or getting too little exercise. PCPs overutilized relatively ineffective risk education strategies and underutilized potentially more effective behavioral or psychological treatments (either in their own practices or via referral to outside programs and specialists).

Cumming et al (1989)[12] carried out a health survey of 484 persons age 4-89 years in suburbs of Sydney. The objectives were to describe preventive activities undertaken by medical practitioners and to assess community's perception of the doctor's role in health promotion. (Response rate 65%). Results indicate that few respondents reported receiving any lifestyle related advice at their most recent doctor visit. In addition, 77% said that the food they ate was rarely or never discussed with their doctor. Despite this low level of advice, doctors (and nurses) were perceived to be the most important source of health information by nearly half the respondents. Clearly medical doctors had difficulty in assisting patients to modify

their nutritional patterns, exercise and smoking behaviour.

In 1987, Henry et al[29] reported their results on attitudes, beliefs and practices in preventive medicine of a random sample of 430 Michigan family physicians. The net response rate was 65%. The health habits of the physicians (practising health promotion themselves) tended to be better than found in earlier studies. There were some weak correlations with professional behaviour. Physicians frequently incorporate many preventive medicine activities into their daily work.

d) barriers to behaviours of PCPs.

Wottke et al (1984)[22] concluded that PCPs perception that patients do not need or do not want the nutritional advice, and would not follow the advice inhibits physicians from delivering nutritional messages in private practice[22].

As major contributors to the underutilization of effective treatments, Orleans et al name physicians' pessimism about their patients' abilities to change to healthy lifestyles, a lack of PCPs' confidence in their own and outside treatments, perceived patient rejection of referral for lifestyle change treatment, along with financial and organizational obstacles to office-based health promotion and a lack of time and training for these activities[24].

Henry et al (1987)[29] report as most important perceived barrier to practising health promotion the lack of patient motivation.

In conclusion, the second period is characterized by better defined attitudes and beliefs of PCPs and more specific behaviours. The picture is less fragmented than in the first period. New in this period is that perceived barriers to nutrition guidance are addressed.

Third period.

In the third period, starting around 1991, the health promotion behaviours on nutrition are becoming more specific. In addition to perceived barriers to nutrition guidance, also some

positive influences are addressed. Examples of these more specific behaviours are PCPs' practices towards high serumcholesterol levels[31,32], nutrition information needs[13] and nutrition opinions[52] of New Zealand GPs, physician counselling behaviours for common nutrition patterns in Canada[34], and sources of nutrition information[35] and information on counselling referrals by US PCPs[35].

a) attitudes and beliefs of PCPs.

Worsley and Worsley[13] surveyed in 1990 the nutrition information needs of New Zealand general practitioners (GPs). Three short questionnaires were administered one to each third of a random sample of 1000 New Zealand GPs. The net response rate was 78%. Most GPs wanted more information about a wide variety of nutrition issues (e.g. dietary counselling techniques, weight loss, food allergies and diabetics). Worsley and Worsley published in 1991 the nutrition opinions of New Zealand general practitioners[62]. Overconsumption of fat, salt and sugar was considered by 74% of the respondents as the primary nutrition problem in New Zealand. The consumption of less fat and more fruit, vegetables and dietary fibre were seen by more than two-third of the GPs as the most important ways of patient to improve their diets. More than 90% of the GPs expressed positive attitudes toward dietary practices consistent with nutritional guidelines. Sixty percent of the GPs agreed that the government should be involved in community nutrition[62].

Langseth and Gemson reported in 1991[35] on a nationwide cross-sectional mail survey, carried out in 1988, of office-based primary care physicians in the United States. The objectives were to determine sources of nutrition information used by physicians, as well as information on attitudes about nutrition in medicine and counselling referrals. Only 464 PCPs responded (response rate 31%). PCPs in the US had positive attitudes about the role of nutrition in medicine and the benefits of nutrition. Almost 85% indicated that nutrition will become even more important in medicine in the future. Three-quarters of the respondents believed that

nutrition counselling was an effective use of physician time and saw benefits to patients from nutrition counselling by a physician. However, their perception of their own preparedness and abilities in this area revealed clearly reservations: about 50% indicated that they were prepared to provide nutrition counselling. About 30% felt ill-prepared to provide nutrition counselling and felt that such counselling would be better left to other health professionals.

b) task perception of PCPs.

Kelly & Joffres published in 1990[33] their research on nutrition education practices and opinions of Alberta family physicians. A random sample of 532 family physicians delivered 255 respondents, a net response rate of 53%. Over 97% of the respondents agreed that educating patients about nutrition is an important role for physicians.

Also in the other studies cited under a) PCPs had a positive taskperception in this respect. The critical remarks on task perception with respect to the first and second period are mostly also justified for the third period.

c) behaviours of PCPs.

Schucker et al reported both in 1987[31] and in 1991[32] on change in cholesterol awareness and action on the basis of national physician and public surveys. The National Heart, Lung and Blood Institute, Bethesda, sponsored national telephone surveys of practising physicians and the adults public in 1983, 1986 and 1990 to assess attitudes and practices regarding high serumcholesterol levels. Each time, approximately 1600 physicians and 4000 adults were interviewed. In 1990, physicians reported treating serumcholesterol at considerably lower levels then in 1986 and in 1983 (median range serumcholesterol at which diet therapy was initiated in 1990: 5.17-5.66 mmol/l (200-219 mg/dl); in 1986: 6.21-6.70 mmol/l (240-259 mg/dl); in 1983: 6.72-7.21 mmol/l (260-279 mg/dl)). In 1990, 65% of the adults reported

having had their cholesterol level checked (1986: 46%, 1983: 35%).

Waisman and Sauve reported in 1990[34] on physician counselling behaviours for common nutrition problems in Canada. A random sample of 180 Calgary family physicians delivered 71 respondents (net response rate 45%). These respondents were interviewed face-to-face on 5 topics (infant nutrition, vegetarism, osteoporosis, cancer and heart disease) and for each topic whether the patient or the physician initiated the discussion on this topic, in this way making 10 possible scenarios. The physicians reported that they themselves most often provided the counselling (60% of the time). When patients were referred for nutrition counselling (38% of the time), 80% of the referrals were to hospital based dieticians. When the patient asked a question on a topic, the physician felt responsible to respond; in this scenario counselling by physicians predominated (76% of the time). In physicians - initiated scenarios, physicians referred more often than that they counselled themselves (45% of the time). In the later case he recognized his competence limits and referred the patient for additional nutrition counselling, usually to a hospital based dietician[34].

New Zealand GPs[13] relied on a variety of sources of nutrition information, preferentially on time sparing sources including textbooks, videos, seminars and leaflets, charts, specimen diets sheets and diet diaries for patients[13].

PCPs in the US relied most on printed professional sources of information, government literature and information from nutritionists and dieticians (79-87%) and somewhat less on information from colleagues[35]. However, 'non-professional sources of information should not be underestimated': newspapers and magazines (60-64%), television, popular books, information from family and friends and radio (all between 18% and 35%).

Sixty-two of respondents made counselling referrals to a hospital or clinic, 13% referred to an outside professional and about 13% provided counselling using in-house staff[35].

d) perceived barriers of PCPs.

The most important perceived barriers to nutrition among Alberta family physicians were lack of reimbursement for physicians (86%), lack of time (48%) and limited access to patient information (42%)[33]. Langseth and Gemson[35] reported as most important barrier for those physicians less interested or less positive about the role of nutrition in medicine the existence of 'other sources' next to professionals sources of nutrition information.

In conclusion the third period delivers more specific nutrition behaviours, perceived barriers to these behaviours and in addition also some positive influences on these behaviours. However, no information is available on the determinants of nutrition guidance of PCPs.

Conclusions from this research (Table 1)

Not all samples in the published research-reports on PCPs did fulfill the ideal situation, to be random national or state-samples, or at least a greater geographical area, to be homogenous samples in specialty of physicians, to consist of enough numbers, to deliver an acceptable net response rate, to deliver information about non-responders and herewith about possible bias, and to be representative for the population of physicians from which they were drawn (Table 1). However, when we started our research project we concluded the following from the literature:

- PCPs do consider nutrition as very important for the maintenance of health.
- PCPs do in majority consider nutrition education and nutrition guidance as part of their task and as part of their active role in health promotion and disease prevention.
- PCPs do experience a number of barriers in nutrition education and nutrition guidance of their patients and most of the research carried out sofar, aimed at identifying these barriers. There are very few reports on positive factors PCPs experience (driving forces).
- The literature does not deliver a clear picture of the total body of determinants of nutrition

guidance practices. Thusfar, studies carried out to search for determinants of nutrition guidance practices of PCPs only identified perceived barriers of PCPs[21,22,24,27,29,35] or addressed itselve to specific areas, for example cardiovascular risk reduction[36].

- More emphasis on nutrition counselling skills and nutrition in the lifecycle may be appropriate in medical education (American Academy of Family Physicians Foundation[40]). Jack et al (1990)[37] concluded the same from a follow-up survey of family physicians' interest in and knowledge of nutrition.
- Physicians perceived themselves least skilled in enhancing patient compliance and achieving behaviour change (Mann and Putnam, 1989[36] and Glanz, 1985[39]).

Some studies indicate that fewer than 10% of PCPs currently perceive themselves as very successful in effecting appropriate risk behaviour changes in their patients. This has a negative impact on physicians practising prevention in these areas. Nevertheless physicians perceived that they could improve their effectiveness several fold with appropriate continuing education and skill development[25]. The same message comes from the Council on Scientific Affairs of the American Medical Association in her report 'Education for health'[38]. PCPs' perceived self-efficacy can be improved by appropriate matters[38].

The US Preventive Services Task Force published a report in 1989[41] on guidelines for nutrition counselling. Until 1992, no published reports were available to what extent primary-care physicians' counselling practices were congruent with these guidelines. PCPs probably do not make sufficient use of the opportunities for health education on nutrition in their consultations[44]. Such a situation is regrettable, as facts are increasing that quality of life depends for a significant part on adequate food and nutrition practices[45]. This is especially true as PCPs are becoming more and more the central gatekeepers to healthy lifestyles.

After mid 1992, a number of very interesting publications on nutrition guidance practices of PCPs were published (e.g. Glanz & Gilboy, 1992[46]; Levine et al, 1993[47]; Lazarus et al, 1993[48]; Glanz et al, 1995[49]; Stostick et al 1995[50]; Ammerman et al, 1993[51]). These studies could not influence the design of our study (the fieldwork was started medio October 1992), but they helped us to interpret our results and to put them into perspective.

Postulated model of the action of determinants of nutrition guidance practices.

An in-dept analysis of the mechanism of action of determinants of nutrition guidance practices of PCPs was carried out on the basis of a postulated model (Figure 1, page 22). The model states that nutrition guidance practices of PCPs are directly and significantly based on a small number of predisposing factors. However a number of intermediary variables determine further the definite outcome of the action. These intermediary variables are either driving forces or perceived barriers. In addition we could also postulate effects of perceived barriers on driving forces. The model is based on the PRECEDE-PROCEED model of Green & Kreuter[1].

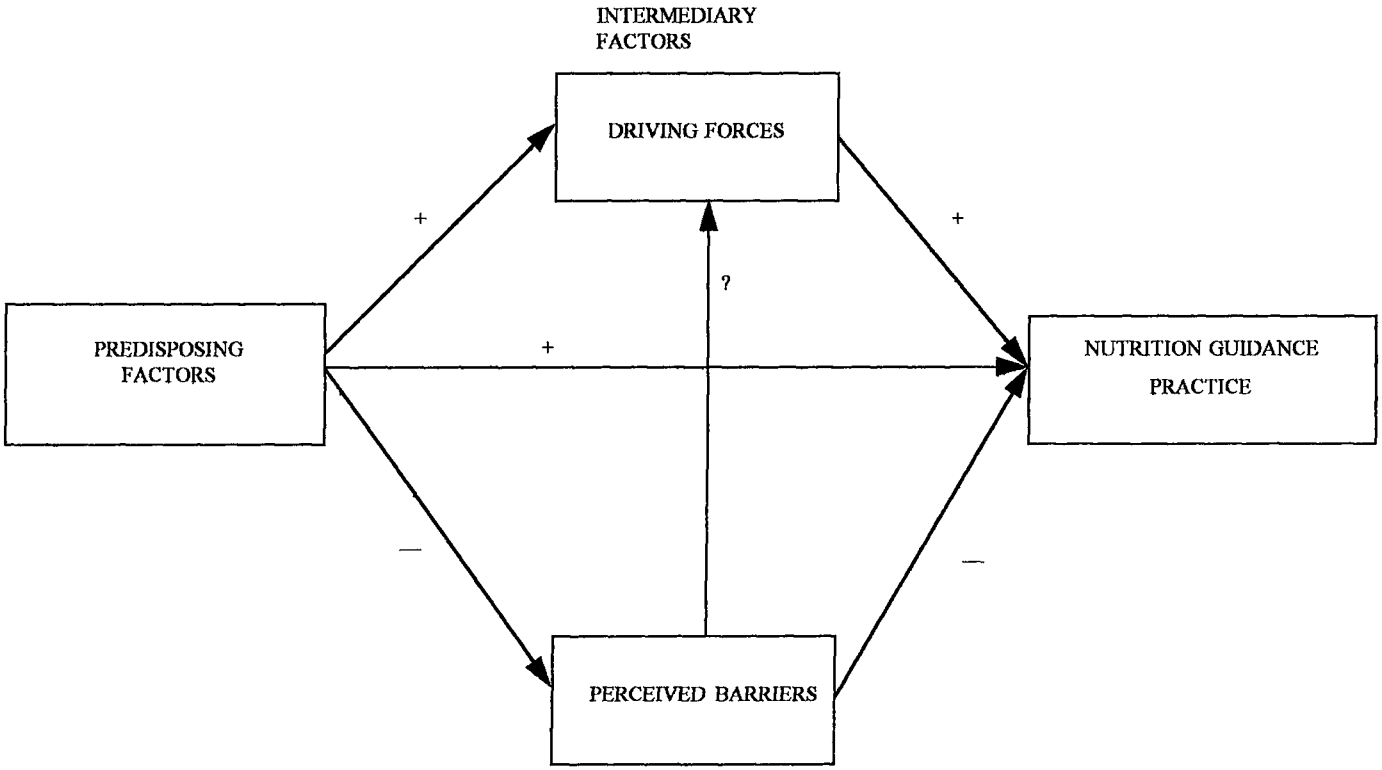
Rationale of the consumer study.

A key question further is the perception of the public about the role of the PCP in nutrition information. We studied this question in a random sample of Dutch consumers. Questions were asked on the referral to eleven nutrition information sources including the PCP, the perceived expertise of these sources, consumers' interest in nutrition information and their nutritional attitudes and beliefs.

Rationale of the study with primary-care physicians.

This study was designed to analyze nutrition guidance practices of PCPs, their nutritional attitudes and knowledge and their interest in the role of nutrition in health and disease. A

Figure 1: Postulated general model of mechanism of action of determinants of nutrition guidance practices of PCPs (+ = positive effect, - = negative effect)



second objective was to identify the determinants of specific guidance practices as well as their working mechanism. Nutrition guidance was studied in five areas; general nutrition education, treatment of overweight, prevention of overweight, treatment of coronary heart disease and prevention of coronary heart disease. These areas where chosen because of their high prevalence in primary care.

As independent variables in the multiple regression analysis to identify determinants of nutrition guidance practices were examined: characteristics of the respondents, nutritional attitudes and beliefs of PCPs and perceived barriers to nutrition guidance practices.

Design consumer study

In March 1991 a telephone survey was carried out among a random sample (on the basis of all telephone numbers in the Netherlands) of Dutch consumers of 18-80 years, living in a household, in which four or more times a week is being cooked. All interview staff of the market research bureau was trained with a written instruction and a training diskette. To avoid selectivity, interviews were organized in the morning, the afternoon and the evening. The interviews were carried out with a computer-aided structured questionnaire with predominantly closed questions. The questions were divided into four categories. The first category consisted of questions measuring referral to 11 sources of nutrition information (asking for information from different individuals and institutions; answer yes or no). The second category consisted of questions measuring the perceived expertise of these 11 nutrition information sources on a five point Likert-scale[60]. The third category consisted of socio-demographic characteristics of the respondents: gender, age, level of education, level of income, having children living at home (yes/no). The fourth category consisted of questions regarding nutritional attitudes, perceived knowledge and behaviour by measuring:

- perceived importance of contribution of diet to health (four point scale).
- perceived wholesomeness of own diet (four point scale).

- attitude on role of diet in coronary heart disease (four point scale).
- attitude on weight-health relationship (five point scale).
- the extent of interest in information about a healthy diet (four point scale).
- perceived own level of general nutrition knowledge (four-point scale).
- the number of self-cooked meals a week (0, 1-3, 4-7).

Attitudinal questions were either scored on a five-point Likert-scale, or on a four point scale (to force decisions).

Design of the study with primary-care physicians

a) Choice of homogeneous group of PCPs.

This research was carried out with PCPs, in practice for between 5 and 15 years. The rationale of this arbitrary choice is the following:

- the clinical behaviour of PCPs becomes stable after 5 years being in practice (Sluys, 1985)[6];
- the group PCPs in practice between 5 and 15 years is the largest group of all PCPs in the Netherlands (45%, Netherlands Institute of Primary Health Care (NIVEL), 1992)[57];
- PCPs in practice during the given time have an age, which make them more sensitive to innovations, compared to older age groups (Rogers, 1983)[52];
- the choice of this age group facilitates a follow-up in future.

b) Focus group interviews

The qualitative research consisted of focusgroup discussions and in-depth interviews with primary-care physicians in practice for between 5 and 15 years. The purpose of the focusgroup discussions was to check ideas and thoughts as gathered from literature about nutritional attitudes and beliefs of PCPs and their nutrition guidance practices, to generate

new ideas and to become aware of motivations of PCPs. The fieldwork of the focusgroup discussions was carried out by two staffmembers of a market research bureau, specialized in this type of research. The focus group discussions consisted of four sessions: one in a big city, Amsterdam (8 PCPs), two in a smaller city (in centre of the country with 8 PCPs and in the eastern part of the country with 6 PCPs) and one in a rural area (southwestern part of the country, 7 PCPs). Twenty-six of the participants were male and three were female.

On the basis of these focusgroup discussions, questions were developed and tested in the in-depth interviews (22 PCPs).

The results of the qualitative research are reported in the Dutch language: De huisarts en voedingsvoorlichting, December 1991 (translated title: The primary care physician and patient nutrition guidance).

c) The development of the questionnaire

The mail questionnaire was specifically developed for this research project using literature and qualitative research (focusgroup discussions and in-depth interviews). A working group was established to improve relevance, clarity and face validity of the questionnaire. The working group did consisted of two health education and extension experts and four nutritionists (faculty members), one primary-care physician, one staff-member of the Dutch College of General Practitioners and two senior market research officers.

The Wageningen GPs Nutritional Practices Questionnaire consisted of ten parts (see Annex 1: Questionnaire with main results, given as percentages of respondents, in Dutch language):

1. *Personal characteristics:* age, sex, length, weight, smoking behaviour, use of diet supplements and following a diet or certain dietary guidelines.
2. *Description of the practice:* year of graduation, year of starting their practice, how many

patients they reckoned their responsibility, how many patients they see in their surgery, how many minutes they plan per patient, and their system of registration.

3. *Perception about task as primary-care physician:* about health education and nutrition education as part of their task, about their nutrition education task in primary, secondary and tertiary prevention, and about their task in nutrition education in treatment and prevention of both coronary heart disease and overweight/obesity.
4. *Organizations, authorities and guidelines in the field of nutrition and nutrition education:* about the extent to which they perceived themselves as being knowledgeable on information and education provided by organizations and authorities in the Netherlands and which organizations they referred to in the last two years to get nutrition information (including dietician and literature). They were also asked about the extent to which they perceived themselves as being knowledgeable on the Dietary Guidelines of the Dutch Nutrition Council[53], on educational material, based on the guidelines, of the Dutch Centre for Food and Nutrition Education[54] and on the 'standard cholesterol' (consensus cholesterol) of the Dutch College of General Practitioners[55].
5. *Nutrition and health:* their degree of interest in the influence of diet on health, as well as the degree of influence on health of a number of factors: physical activity, stress, hygiene, dietary pattern, use of alcohol, smoking and heredity. In addition, their perception of difficulty for patients with health problems to change their life style and dietary habits as well as their perceived influence on diet and life style of patients with health problems was asked.
6. *Treatment and prevention of overweight:* attitudinal questions on a five-point Likert-type scale[60] about treatment and prevention of overweight as well as their perceived success of their efforts. In addition, they were asked about their practice of treatment of overweight patients.

7. *Treatment and prevention of coronary heart disease:* attitudinal questions about the standard cholesterol of the Dutch College of GPs and about their perceived self-efficacy in nutrition guidance in prevention and treatment of coronary heart disease.

5,6,7.

Literature and previous qualitative research delivered possible perceived barriers of PCPs to give general nutrition education, to treatment and prevention of overweight and to treatment and prevention of coronary heart disease and these were asked from respondents[1,21,22,24,27,29,35,36,52,60]. In addition the perceived three most important barriers were asked.

8. *Overweight in daily practice:* to the extent they pay attention to the weight of their patients, by what methods they ascertain overweight, and their knowledge of definitions of overweight and obesity in terms of Body Mass Index (BMI) according to the Dutch Health Council[56]. In addition they were asked attitudinal questions on overweight in daily practice, loss of weight and education in this field (5-points Likert-type scale).
9. *Nutrition guidance in daily practice:* the amount of patients seeing them because of an illness or complaint where diet is involved, the amount of patients they give nutrition guidance, to score their nutrition education in terms of curative and preventive, to indicate their amount and way of use of written education material in their surgery and nutrition guidance the active or passive way in which they give nutrition education.
10. *Different strategies of nutrition education:* of many strategies to educate their patients and to educate the GPs, their perceived effectivity and applicability in their practice, and their actual implementation. In addition their perspective on nutrition was asked.

d) Non-participation

Non-participation was based on two sources of information: the data of the Netherlands Institute of Primary Health Care (sex, year, and so on) and the non-response questionnaire. In the non-response questionnaire respondents were asked about their sex, year of starting their practice, type of practice, grade of urbanization, how many patients they reckoned their responsibility, their degree of interest in the influence of diet and health, about nutrition education as part of their task, about their task perception in daily practice in general and in the field of nutrition education (in terms of curative and preventative) and about their intensity of nutrition education and information.

e) Pretest

The aim of the pretest - which was carried out with 2 PCPs, reading the initial personal letter and completing the questionnaire within a room with an experienced market research officer as observer - was:

- to study acceptance of the draft initial personal letter inviting the PCP to participate;
- to study at what points in the questionnaire there where difficulties in completing the questionnaire and to study item-non-response;
- to study perception of financial incentive (25 Dutch guilders).

The respondents perceived the financial incentive too low, given the time to administrate the questionnaire (about 40 minutes). After receiving the literature on financial incentives[58,59]. it was decided to give responders a financial incentive of 50 Dutch guilders and a chance to win one out of six culinary weekends with partner in a place of choice in the Netherlands (implementation to be carried out by a notary, together with officers of the market research bureau).

f) Pilot-study

The aims of the pilot-study with an aselect sample of 50 PCPs - in practice for between 5 and 15 years - were the following:

- to study response-pattern in relation to reminder-letters (Dillman, 1978[60]);
- to test the feasibility and effectiveness of reminding by telephone in the last part of the response-traject;
- to study the possibility of achieving a response of 50-65%;
- to study item-non-response and to determine the mean time needed to administer the questionnaire.

The net response was ultimately 68%. Both reminding by letters and reminding by telephone proved to be feasible and effective. The item-non-response was very low (1.6%, Dillman[60]). The mean time needed to administer the questionnaire was 41 minutes.

g) Sample

A random sample of 1000 PCPs was drawn from the 2798 PCPs in the Netherlands who had been practising for between 5 and 15 years on the following basis: an equal chance for every PCP, and only one member of each (combined) practice in the sample in order to assure independent self-completed questionnaires. (Database Netherlands Institute of Primary Health Care, NIVEL, Utrecht).

h) Implementation

In October 1992, the 1000 PCPs were sent the Wageningen GPs Nutritional Practices Questionnaire, based on the methodology describes by Dillman[60]), which was pilot-tested. After the initial personal letter and questionnaire (see Annex 2), a personal follow-up letter was sent every two weeks (three times), if necessary. After eleven weeks, the first telephone reminders were started (maximum three reminders).

Outline of the thesis

In Chapter two we described the findings on the referral to eleven nutrition information sources including the PCP of a random sample of Dutch consumers. Also consumers' perceived expertise of these sources, personal interest in nutrition information and their personal nutritional attitudes and beliefs (Chapter 2). Perceived barriers to nutrition guidance by primary-care physicians and their involvement in nutrition guidance - as well as their nutritional attitudes and beliefs - are described in Chapter 3.

The determinants of specific nutrition guidance practices of PCPs are described in Chapter 4. The mechanism of action of determinants of nutrition-guidance practices of PCPs was studied on the basis of a postulated general model (Chapter 5).

The nutrition information seeking behaviour of PCPs, their level of perceived effectivity and applicability of different nutrition information sources as well as of different strategies of nutrition information of their patients are reported in Chapter 6. In this chapter are also reported the strategies PCPs do implement in patient nutrition information, as well as the determinants of this behaviour. Finally, the main findings and possible implications of this research project for nutrition education aimed at PCPs as well as further research needs are formulated in Chapter 7.

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Chapter 2

CONSUMER EXPECTATIONS ABOUT NUTRITION GUIDANCE: THE IMPORTANCE OF PRIMARY-CARE PHYSICIANS

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ABSTRACT

In order to clarify the role of the primary-care physician (PCP) in nutrition information of the public we investigated in a random sample of Dutch consumers their referral to eleven nutrition information sources including the PCP, their perceived expertise of these sources, their interest in nutrition information and their nutritional attitudes and beliefs.
Factor analysis over these eleven sources of nutrition information delivered two factors: the factor 'non-commercial sources' (α=.70) and the factor 'commercial sources' (α=.78). Respondents' referral to and perceived expertise of 'non-commercial sources' is higher compared with 'commercial sources' (respectively 54% versus 21%, P<.0001 and 3,9±0,6 versus 2,7±0,6 (mean ± SD), P<.01). The individual Spearman correlation coëfficient between referral scores and perceived expertises was rho =.35±.36 (mean ± SD). For most sources referral to that source was dependent on a higher interest in information about a healthy diet and on perceived expertise of the source. In the factor 'non-commercial sources' there are three leading sources: PCP, dietician and Food and Nutrition Education Bureau (FNEB). Careful analysis revealed that because of the high referral score, the high perceived expertise and the reach of nearly all segments of the population, PCPs are in a unique position over the dietician and FNEB.

INTRODUCTION

Physicians are perceived as the best source of health information, the most credible source and after the media the source most often used[1-5]. For nutrition information primary care physicians (PCPs) can potentially play a key role[4]. In one year about 70% of the patients visit the doctor at least once, in three years time this figure is 90-95%[5]. In 14-28% of the consultations diet comes up for discussion[3,6,7], the initiative being evenly divided between PCP and patient[6].

PCPs probably do not make sufficient use of the opportunities for health education on nutrition in their consultations[8,9]. This is regrettable, because there is increasing evidence that quality of life depends for a significant part on adequate food and nutrition practices[10]. PCPs are not aware of the extent to which patients value life style[11] and underestimate the interest of patients in receiving health education[12]. Patients are of the opinion that PCPs should show more interest in their lifestyle[13,14].

Most research has been directed towards the medical profession as such and their involvement in nutrition information activities. In this paper we will describe the findings of a study in consumers of the medical services, their referral to eleven nutrition information sources, their perceived expertise of these sources, their interest in nutrition information and their nutritional attitudes and beliefs. Specific attention is given to the position and role of PCPs as an expertise source in nutrition.

METHODS

In March 1991 a telephone survey was carried out among a random sample (on the basis of all telephone numbers in the Netherlands) of Dutch consumers of 18-80 years, living in a household, in which four or more times a week is being cooked. All interview staff of the

market research bureau was trained with a written instruction and a training diskette. To avoid selectivity, interviews were organized in the morning, the afternoon and the evening. The interviews were carried out with a computer-aided structured questionnaire with predominantly closed questions. The questions were divided into four categories. The first category consisted of questions measuring referral to 11 sources of nutrition information (asking for information from different individuals and institutions; answer yes or no). The second category consisted of questions measuring the perceived expertise of these 11 nutrition information sources on a five point Likert-scale[15]. The third category consisted of socio-demographic characteristics of the respondents: gender, age, level of education, level of income, having children living at home (yes/no). The fourth category consisted of questions regarding nutritional attitudes, perceived knowledge and behaviour by measuring:

- perceived importance of contribution of diet to health (four point scale).
- perceived wholesomeness of own diet (four point scale).
- attitude on role of diet in coronary heart disease (four point scale).
- attitude on weight-health relationship (five point scale).
- the extent of interest in information about a healthy diet (four point scale).
- perceived own level of general nutrition knowledge (four-point scale).
- the number of self-cooked meals a week[0,1-3,4-7].

Attitudinal questions were either scored on a five-point Likert-scale, or on a four point scale (to force decisions).

STATISTICS

The analysis was carried out using SPSS[16]. The nutrition information sources were grouped by means of a principal components analysis with varimax rotation (factor analysis) on the basis of the question on perceived expertise of the sources. Crohnbach's alpha was used as a

measurement of reliability of scales derived from factor analysis. Factors were calculated as sums of items, standardized for scale width. Differences between the percentage of consumers referring to different sources were tested with the McNemar-test. Relations between variables were tested with Pearson correlations. Differences in perceived expertise of the nutrition information sources were tested with the paired t-test. Relations between perceived expertise of a source and referral to that source were tested with Spearman correlation. Characteristics of consumers which influence the use of a certain nutrition information source or a group of nutrition information sources were analyzed in two different ways: univariate (with t-test) and with multivariate logistic regression (which intrinsically corrects for confounding factors, if present)[16].

RESULTS

Response, characteristics and background of respondents.

Of 1200 persons of the sample, 628 persons responded (52%). 20% refused to comply to the survey; because of language reasons no communication was possible with 1% and 27% could not be contacted after two retries. Therefore, the net response rate is 53%. Female respondents are overrepresented (57% females, 43% males), probably because in general, women are more time at home than men (Table 1, page 42). Compared with the Dutch population (18-80 year) as a whole, the age group of 18-29 years is somewhat underrepresented (18% versus 22,5%)[17], (probably because most of them live in a one- or two-person household, which make them more difficult to contact by phone) and the higher level of education is somewhat overrepresented (22% versus 15,6%)[17], which is the result of their higher interest in the subject (Table 1, page 42). On the basis of the social exchange theory[18], it was anticipated that many factors will influence the decision to respond to the survey; the extent of interest in the subject being one of the most important ones.

Table 1. Characteristics, nutritional attitudes and beliefs of 623 respondents

Gender	- 43% male - 57% female
Age group 18-29 30-39 40-49 50-64 65-80	- 18% - 24% - 20% - 22% - 17%
Level of education low middle high	- 32% - 46% - 22%
Extent of interest in information about a healthy diet	- 8% not interested - 26% moderately interested - 49% interested - 17% very interested

Therefore, interested people in nutrition will be overrepresented among the respondents compared with the population. In general, interest in a topic is also an important factor asking for information on that topic[18]. 66% of the respondents are (very) interested in information about a healthy diet (Table 1, page 42). Women are more interested than men ($p < .001$). All age-groups have about the same interest in information about a healthy diet. The group with a high level of education is more interested in information on a healthy diet compared with the groups with low and with mean level of education ($p < .05$).

Perceived expertise of nutrition information sources.

As reported earlier from this telephone market research survey[4], the primary care physician, friends/neighbours and family have the highest referral score as nutrition information source (respectively 36%, 36%, 35% of the respondents uses this source) . These three sources have a significantly higher score than dietician (21%) and the Food and Nutrition Education Bureau (17%) ($p < .05$). 71% of the respondents uses at least one source; 54% of the respondents uses one to four different sources. In this article, we will only include and discuss the eleven nutrition information sources as shown in Table 2 (page 47) which were included in the questionnaire. Friends/neighbours and family are excluded, because they can not serve as an intermediary group[19] to inform the consumer: they are comparable to the consumers.

Table 2 (page 47) shows the referral score and the mean level of perceived expertise of the different nutrition information sources in the present study. The dietician and the Food and Nutrition Education Bureau (FNEB) have the highest perceived expertise, followed by the PCP. However, although being statistically highly significant ($p < .0001$), the differences in perceived expertise between PCP at the one side and dietician, FNEB, consumer organisations, district nurse, health food shop personnel and chemist at the other side are not large. On the other hand the highest referral score is in the hands of PCPs. The differences

in perceived expertise of PCP compared with druggist, greengrocer, butcher and baker are, in contrast, both highly significant and large.

For all the sources of Table 2 (page 47), there is a relationship between perceived expertise of the source and referral score (= concordance), Spearman's rho ranging from rho =.16 (druggist) to rho =.35 (consumer organisations). Respondents who refer to a certain source have compared with the respondents who do not refer to that same source, a higher perceived expertise of that source ($P<.001$) and this is true for all sources. The individual Spearman correlations between referral score and perceived expertise were calculated for all respondents (n=328). 52 respondents perceiving no variance in expertise of the eleven sources and 243 respondents who do not refer to any of the eleven sources had to be excluded in the analysis. The mean individual Spearman correlation coefficient was rho=.35 (SD=.36). The Spearman correlation coefficient between mean referral score per source and mean perceived expertise of that source is rho =.90 (P=.001, n=11).

Factor-analysis on nutrition information sources

The eleven sources of nutrition information were entered into the factor-analysis. The analysis was carried out on the basis of the question on perceived expertise of the sources. Two factors were extracted. High positive factorloadings (>.55) on factor 1 have: butcher, greengrocer, baker and druggist. These sources can be characterized as commercial nutrition information sources (Crohnbach's α=.78). High positive factorloadings ($\geq$.55) on factor 2 have: PCP, Food and Nutrition Education Bureau, dietician, consumer organization, district nurse. These sources can be characterized as non-commercial sources (Crohnbach's α=.70). The factorloadings of the chemist and health food shop personnel on both factors are positive, but $\leq$.45. These sources have both a commercial and a non-commercial character. A respondent has a referral score on the factor (non-)commercial sources when he/she uses at least one of the constituting sources of this factor. Non-commercial sources are more

referred to by respondents than commercial sources: 54% versus 21%, the difference being highly statistically significant ($p < .0001$). The mean perceived expertise (score 1-5) ($\pm$SD) of non-commercial sources ($3,9 \pm 0,6$) is significantly higher than that of commercial sources ($2,7 \pm 0,6$) ($p < .01$). For both non-commercial sources and commercial sources the perceived expertise of respondents who refer to these sources is statistically significantly higher than the perceived expertise of respondents who do not refer to these sources ($p < .01$).

Non-commercial sources

In our search for determinants of referral to non-commercial sources, we carried out a univariate analysis (t-test) as well as a multivariate analysis (logistic regression) to correct for possible confounding factors. The variables of Table 3 (page 48) were entered as possible determinants in the univariate analysis as well as in the logistic regression. In the univariate analysis, it was found (Table 3, page 48) that many variables act as determinant of referral to non-commercial sources. However, in the logistic regression-analysis, it was found (Table 3) that non-commercial sources of nutrition information were more referred to by people with children living at home, with a more positive attitude on role of diet in coronary heart disease, with a more positive attitude on weight-health relationship and with a higher interest in information about a healthy diet. Perceived expertise of the source was not a determinant, possibly because of the variance in level of perceived expertise of non-commercial sources was only small.

Commercial sources

Also in our search for determinants of referral to commercial sources, we carried out a univariate analysis as well as a multivariate analysis (logistic regression). In the univariate analysis it was found (Table 3, page 48) that many variables act as determinant of referral to commercial sources. However, in the logistic regression analysis it was found (Table 3) that

commercial sources of nutrition information were more referred to by people with a more positive attitude on role diet in coronary heart disease, with a higher interest in information about a healthy diet and with a higher perceived expertise of the source.

Determinants of referral to certain nutrition information sources

What are the factors that determine consumers' referral to individual nutrition information sources? This was again investigated with a univariate analysis (t-test) and with a multivariate analysis (logistic regression) to correct for possible confounding factors. As possible determinants were entered in both analyses the variables of Table 3 (page 48). We will especially address the results of the sources with the highest referral score and the highest score on perceived expertise: PCP, dietician, Food and Nutrition Education Bureau (FNEB) (Table 2, page 47).

Primary-care physician

In the univariate analysis it was found (Table 3, page 48) that many variables act as determinant of referral to the PCP as a source of nutrition information. However, in the multivariate logistic regression analysis the PCP as a source of nutrition information was more referred to by people without children living at home, people with a higher interest in information about a healthy diet and with a higher level of perceived expertise of the source.

Dietician

In the univariate analysis it was again found (Table 3, page 48) that many variables act as determinant of referral to the dietician as a source of nutrition information. Nevertheless, in the logistic regression analysis the dietician as a source of nutrition information was more referred to by older people, people with a lower level of education, with a higher interest in information about a healthy diet and with a higher perceived expertise of the source.

Table 2. Referral score and perceived expertise of the 11 sources of nutrition information (n = 623)

Source of nutrition information	Referral score %	Mean level of perceived expertise [1] ± SD	Concordance: Spearman's rho [2]
1. Dietician	21	4.3 ± 0.9	.25
2. Food and Nutrition Education Bureau	17	4.3 ± 0.9	.25
3. Primary-care physician	36	3.9 ± 1.1	.20
4. Consumer organisations	12	3.7 ± 1.0	.35
5. District nurse	13	3.5 ± 0.9	.34
6. Health food shop personnel	15	3.4 ± 1.0	.25
7. Chemist	11	3.4 ± 1.0	.30
8. Druggist	11	2.9 ± 1.0	.16
9. Greengrocer	9	2.7 ± 1.0	.28
10. Butcher	11	2.7 ± 1.0	.26
11. Baker	5	2.6 ± 0.9	.25

[1] Five points scale: 1 (= no expertise) ... 5 (= very high expertise)
[2] All concordance values were statistically significant at $P < .01$

Table 3. Univariate analysis (t-test)(B)and multivariate analysis (logistic regression)(A)with as dependent variable referral to a certain nutrition information source or to a group of sources, based on factor-analysis.

Nutrition information source	Commercial sources (factor 1)		Non-commercial sources (factor 2)		PCP		Dietician		Food and Nutrition Education Bureau	
	A	B	A	B	A	B	A	B	A	B
Gender		*		*		*		*		
Age						*	4.76	***		
Level of education		*				*	0.50	*	2.61	***
Level of income										
Children living at home			1.64	*	0.65					
Number of self-cooked meals a week		**		***		**		***		
Perceived general nutritional knowledge		**		***				**	4.66	***
Perceived importance of contribution of diet to health		*		*						***
Perceived wholesomeness of own diet								**		
Attitude on role of diet in coronary heart disease	2.36	***	2.23	***		**		***	2.89	***
Attitude on weight-health relationship			1.72	***		**		***		*
Interest in information on diet and health	6.23	***	5.37	***	3.63	***	6.82	***	8.67	***
Perceived expertise of the source	5.00	***			3.39	***	6.69	***	4.01	***

A) logistic regression analysis: $p < .05$, figures are adjusted Odds rato's $= e^x$
x= log (Odds Ratio) of variable, multiplied by (the number of categories of that variable minus 1)
B) univariate analysis (t-test):
* $p < .05$
** $p < .01$
*** $p < .001$

Food and Nutrition Education Bureau (FNEB)

In the univariate analysis it was also found (Table 3, page 49) that many variables act as determinant of referral to the FNEB as a source of nutrition information. Anyhow, in the logistic regression analysis the FNEB as a source of nutrition information was more referred to by people with a higher level of education, a higher perceived general nutritional knowledge, a more positive attitude on role of diet in coronary heart disease, a higher interest in information on a healthy diet and a higher perceived expertise of the source (Table 3, page 49).

PCP compared with dietician and FNEB

When comparing the PCP as a source of nutrition information with his best competitors , the dietician and the FNEB, it is clear that the PCP has the highest referral score and a somewhat lower perceived expertise (the difference is not large) (Table 2, page 47). The next step is to take into account the determinants of referral to the three sources. When referral to a nutrition information source has only a minimal number of determinants, then this source will reach almost all segments of the population (segments with respect to the variables of Table 3, (page 49).

As tested with logistic regression analysis, referral to these three sources (Table 3, page 49) is positively influenced by the variables interest in information about a healthy diet and perceived expertise of the source. Six independent variables of Table 3 (page 49) (gender, level of income, number of self-cooked meals a week, perceived importance of contribution of diet to health, perceived wholesomeness of own diet, and attitude on weight-health relationship) do not influence referral to these three sources. Referral to the PCP has one additional determinant: people without children living at home refer more to the PCP than people with children living at home (This variable does not influence referral to dietician or FNEB). The variables which are discussed further do not have an influence on referral to

PCP, but do have an influence on referral to dietician or FNEB. Older people refer more to the dietician than younger people do, whereas age does not influence referral to FNEB. People with a higher level of education refer more to the FNEB than people with a lower level of education, in contrast with the dietician where the situation is the opposite. People with a higher perceived general knowledge and people with a more positive attitude on role of diet in coronary heart disease refer more to the FNEB; these variables do not influence referral to PCP or to dietician.

DISCUSSION

This study shows that consumers do prefer PCPs as a source of nutrition information within a groups of eleven potential sources. The conclusion can be made that many more segments of the population (segments formed on the basis of the variables of Table 3, (page 49) do refer to PCPs than to dietician and FNEB, PCPs' best competitors as source of nutrition information. This can be stated on the basis of the following observations:

- Of all sources, the PCP is referred to by the highest percentage of respondents: 36%. Although also friends/neighbours and family have equally high referral scores, they are not comparable with the PCP because they can not serve as an intermediary group[19] to inform the consumer. This finding is in agreement with the literature (media not included in possible sources)[3,20-23].
- The level of perceived expertise of the PCP is among the highest (Table 2, page 47). The dietician and the Food and Nutrition Education Bureau have a slightly higher perceived expertise than the PCP. In the literature the family doctor[3] and physicians[20] are reported the nutrition information sources perceived as the most credible source.
- The PCP is a member of the non-commercial group of nutrition information sources, derived from factor analysis. The non-commercial sources are more referred to by the respondents than the commercial sources; as a group they have a much higher level of perceived expertise.
- The decision of the consumer to refer to PCP as a source of nutrition information is solely dependent on interest in information about a healthy diet among consumers (66% of the respondents is (very) interested!), on perceived expertise of the source (which is among the highest) and on children living at home (Tables 2 and 3). It is further independent of the other variables given in Table 3 (page 49), which made us to conclude that nearly all segments of the population are in principle reached by the PCP, which is not the case with

dietician or FNEB.

- The high level of perceived expertise of the PCP as a nutrition information source is also important from another point of view. In this study we consistently found that respondents referring to a certain source had a significantly higher level of perceived expertise of that source than the respondents not referring to that source. This holds also true for groups of sources (based on factor-analysis), i.e. the factors 'non-commercial sources' and 'commercial sources'. In addition, there was a significant individual Spearman correlation between referral score and perceived expertise of rho=.35±.36 (mean ± SD). Worsley[3] found a Pearson correlation of r=.75 between referral score per source and reliability of that source; we find a Spearman correlation of r=.90 between referral score per source and perceived expersise of that source.

The literature suggests that PCPs are not aware of the extent to which patients value lifestyle advises[11] and that they also underestimate the interest of patients in receiving health education[12]. In patients' opinion PCPs should show more interest in their lifestyle[13,14]. Although our results show clearly that consumers do prefer the PCP as a source of nutrition information above other sources (including the dietician and the FNEB), we have the strong impression that PCPs are not aware of this given position and expectations by patients and or consumers.

In a recent study of the Dutch College of General Practitioners, in which a random sample of general practitioners (GPs) and a representative sample of the Dutch population was studied, it was found that both GPs and general public in large majority agreed on the necessity of adequate health information and education during medical practice[24,25]. To ensure adequate nutrition guidance to patients by PCPs could be one of the steps to improve this situation. PCPs may have misperceptions over the interest in nutrition of consumers and consumers may have misperceptions in what PCPs can do for them. Improving nutrition knowledge of

PCPs seems to be a topic which still needs attention as PCPs experience this as a deficit in getting actively involved[26,27]. This eventually would lead to a higher self-efficacy of PCPs[28,29] and possibly also to a change in their perceived role in nutrition information to the patients/the consumer. On the other hand, it seems fair not to overlook the possibility that patients may have unrealistically high expectations of the PCP. In such a complex situation, good communication between PCP and patient becomes even more important. Are PCPs and patients really aware of the need of good communication in daily practice, and do they have the skills to apply such communication? Nevertheless, from the point of view of health promotion planning[30], the conditions for nutrition information of patients/consumers by PCPs must be considered as positive and encouraging.

Our findings regarding determinants of referral to nutrition information sources seem to be in contrast with the literature with respect to gender and age[3,20-22] income[21,22], nutrition knowledge[23], level of education[3,22], and children living at home[3]. We must conclude that all the authors except Worsley[3] based their conclusions on univariate analysis[20-23], where we based our conclusions on multivariate analysis, more especially logistic regression analysis which intrinsically corrects for confounding factors.

In particular because of the high referral score, the relatively high perceived expertise and the reach of nearly all segments of the population, PCPs are in a unique position over ten other analysed sources of nutrition information, including the dietician and the Food and Nutrition Education Bureau.

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Chapter 3

Nutrition guidance by primary-care physicians: perceived barriers and low involvement

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ABSTRACT

Objective-To investigate the activities of the general practitioner (GP) in nutritional matters and the factors that influence their attitudes, knowledge and behaviour, especially perceived barriers.

Design-Postal questionnaires (result of focusgroup discussions and in-depth interviews) were sent to a nationwide random sample of GPs in the Netherlands.

Subjects-1000 GPs, in practice for between 5 and 15 years.

Main outcome measures-The identification of GPs perceived barriers to nutritional guidance of their patients, their nutritional attitudes and behaviours.

Results-Net response rate was 64% (633/990). GPs perceived smoking to be the greatest health hazard, followed by dietary pattern and genome. 70% expressed considerable interest in the role of nutrition in health. In daily practice nutrition plays a minor role in the work of the GP. 28% of GPs gave daily nutrition information to about 10% of their patients and 48% to about 5% of their patients. It is found that GPs do perceive strong barriers of being involved in nutrition issues during their practice. The most important barriers expressed were: not being trained in nutrition, lack of time to address nutrition issues and the perception that patients lack motivation to change lifestyle and/or dietary patterns.

Conclusions-The involvement of GPs in nutritional matters is very low. The fact that lack of training is considered as the most important barrier is however unexpected. This finding offers possibilities for improvement in which in service-courses and inter-active distant-learning programmes on nutrition for GPs should get special attention.

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Descriptors-general practitioner, nutrition knowledge, nutrition attitudes, nutrition perceived barriers.

INTRODUCTION

The contribution of general practitioners (GPs) to nutrition education of their patients is poorly understood. Levine et al. (1993) observed that clinical practices of GPs in this field are well below the minimum level as defined by Young et al. (1983). Although they found favourable attitudes of GPs towards using nutrition guidance in their practice, these were not consistent with the GPs own reports of clinical performance.

GPs probably do not make sufficient use of the opportunities for health education on nutrition in their consultations (Boulton & Williams, 1983). Such a situation is regrettable, as facts are increasing that quality of life depends for a significant part on adequate food and nutrition practices (James, 1988). This is especially true as GPs are becoming more and more the central gatekeepers to healthy lifestyles. As such they are perceived as the best and most credible source of health information, and after the media, the source most often used (Boulton & Williams, 1983; Weinberg & Andrus, 1982; Worsley, 1989; Hiddink, 1992; Orleans et al., 1985; Nutting, 1986). Nutrition education in medical schools is of paramount importance (Winick, 1993; Zimmermann & Kretchmer, 1993; Kretchmer, 1994).

This study was designed to analyse the GPs knowledge and interest, attitudes and behaviour of GPs towards the role of nutrition in health and disease. The main interest was to shed light on promoting factors and perceived barriers of GPs to becoming more involved in nutrition matters during patient consultation. In other words, studying the important question of what kind of predisposing, enabling and reinforcing factors (Green & Kreuter, 1991) are acting when GPs discuss dietary pattern changes with their patients.

METHODS

A random sample of one thousand primary-care physicians was drawn from the 2798 GPs in the Netherlands who had been practising for between 5 and 15 years on the following basis:

an equal chance for every GP, and only one member of each (combined) practice in the sample in order to assure independent self-completed questionnaires. Addresses and information on sex, type of practice, year of starting practice and grade of urbanization of the practice, were obtained from the database of the Netherlands Institute of Primary Health Care (NIVEL). In October 1992, the 1000 GPs received a specially developed mail questionnaire (the Wageningen GPs Nutritional Practices Questionnaire*), based on the methodology of Dillman (1978). After the initial personal letter and questionnaire, a personal follow-up letter was sent every two weeks (three times) (Dillman, 1978), if necessary. After eleven weeks, the first telephone reminders were started (three reminders), which in the case of meeting with refusal, became a non-response questionnaire contact.

The Wageningen questionnaire was based on qualitative research (focus group discussions and in-depth interviews) and consisted of issues such as: personal characteristics; description of the practice; task perception as primary-care physician; sources of information on nutrition; dealing with nutrition education in practice and the barriers to be coped with. Special attention was given to two typical examples of nutrition-relevant behaviour: treatment and prevention of overweight and coronary heart disease. Barriers to treatment of overweight and to treatment of coronary heart disease were scored on a two-point scale (yes/no). The items which were asked as possible barriers came from the literature and from previous qualitative research. In addition, the three most important barriers were required to be specified. Attitudinal questions were scored on a five point Lickert scale (Dillman, 1978). Information about non-participation was based on two sources: the NIVEL-data (background information) and the telephone non-response questionnaire. In the non-response questionnaire, respondents were asked six key questions from the regular questionnaire.

* Obtainable from the first author.

Statistics

Principal components analysis with varimax rotation (factor analysis) was used for scale construction (SPSS Reference Guide, 1990). A square root transformation was applied, if necessary, to obtain approximate normality. Crohnbach's α (Cr-α) was used as a coefficient of reliability of scales derived from factor analysis. Associations were studied using Pearson's correlation test. Differences between groups were tested with the student's t-test or the chi-square test.

RESULTS

Participants

633 GPs responded to the questionnaire, 114 female and 519 male GPs. The mean age of the participants ($\pm$ SD) was 41,0 ($\pm$ 3,6) years and they had been in practice for an average of 11 years. Six percent of the GPs used diet supplements and 13% followed a special diet or certain dietary guidelines. The mean practice list was almost 2300 patients. The GPs saw 30-35 patients a day, and planned 10 minutes per consultation.

Response

The net response was 64%. A further 7% completed the non-response questionnaire by telephone and 26% gave reasons for refusal. The 633 respondents were well representative of the population of GPs who had been in practice for between 5 and 15 years according to sex, and year of starting practice. GPs from rural areas seemed to have elicited a higher response than GPs from big cities. The respondents are well representative according to sex by type of practice distribution. Male GPs in single practice appeared to be slightly under-represented, a phenomenon which is known from the literature (Mabeck & Vejlsgaard, 1980). The answers to the questions, given by the respondents of the non-response

questionnaire (NRQ;N=63) were compared with the answers to the same questions given by the 633 respondents. Five out of six variables produced statistically significant different answers in the two groups (t-test). These five variables were the following ones. First, NRQs indicated a higher degree of interest in the topic diet and health. Second, NRQs indicated lower activity of giving nutrition information in daily practice. Third, NRQs task perception was more preventive oriented and RQs was more curative. Fourth, NRQs had a larger practice-list of patients and fifth, NRQs had more solo and less group practices. Although significant selectivity could be observed, deviations from the total population are so minor, that the introduction of weighting of subgroups was not necessary.

The mean item non-response in our survey was very low: 1.6% (Dillman, 1978). The mean time needed to complete the questionnaire was 41 minutes.

Health promotion perception

Seventy percent of GPs claimed to be interested in the contribution of diet to health and 25% said they were 'neutral' in this respect.

Dutch GPs confirmed that general health information (95%) and nutrition information (76%) is a part of their task, also at individual prevention level. However, they perceived their tasks in health and nutrition information to be more at secondary or tertiary level (90% positive answers) rather than primary prevention (60% positive answers).

GPs saw daily two patients out of 35 in whom they concluded that bad dietary habits had clearly contributed to the disease or health complaint. 28% of the GPs paid attention to the bodyweight of at least 80% of their patients, while 37% did this in 50-80% of their patients. For the assessment of overweight, 30% used the Body Mass Index (BMI); 32% used BMI and another assessment (clinical appearance or patient's assessment) and 16% used only clinical appearance. Half the GPs differentiated between overweight and obesity. 28% gave nutrition information daily to about 10% of their patients, and 46% to about 5% of their

patients every day. It was also noted that about half the GPs agreed that they themselves should follow exemplary lifestyles and dietary patterns.

The vast majority of GPs were aware of, and used, nutrition information. The data show that 72% of GPs regularly contacted dieticians or referred patients to them; 34% sometimes searched the literature on nutrition issues; 33% had contacted the Netherlands Centre for Nutrition Education and 22% had been in contact with the Netherlands Heart Foundation for nutrition information. 15% were not involved in any activity related to nutrition information.

Do GPs have faith in the ability of their patients to change their lifestyle and dietary habits? Only 40% believe that a specific recommendation by them to change the lifestyle and dietary habits will be followed up by their patients. About 25% consider that this advice will be ignored, and about 30% were undecided.

Knowledge of dietary guidelines.

We were interested to know whether GPs were aware of dietary guidelines as published, for example, by the Netherlands Nutrition Council (Dutch Nutrition Council, 1986), the Netherlands Centre for Nutrition Education (Netherlands Bureau for Food and Nutrition Education, 1991) or the guidelines on serumcholesterol and diet as formulated by the Netherlands Association of General Practitioners (Van Binsbergen et al., 1991). Nearly all GPs (91%) said that they were familiar with the cholesterol standard guideline, formulated by their own association. On the other hand, the rather broad and quite general dietary guidelines, formulated by the other organizations were familiar to a much smaller group (23-32%).

GPs health and nutrition practices.

Should the lifestyle and dietary practices of a GP set an example to their patients? About half agreed that they should set an example in this respect, and about a quarter did not agree or

were undecided.

What do GPs themselves perceive as good or bad habits with regard to health practices? On the basis of an assessment of the degree of influence on health of a number of factors (on a ten-point scale), they indicated that smoking is the most influential health risk factor followed by unbalanced dietary patterns and human genome. These three factors are then followed by reduced physical activity, stress, poor hygiene and alcohol abuse.

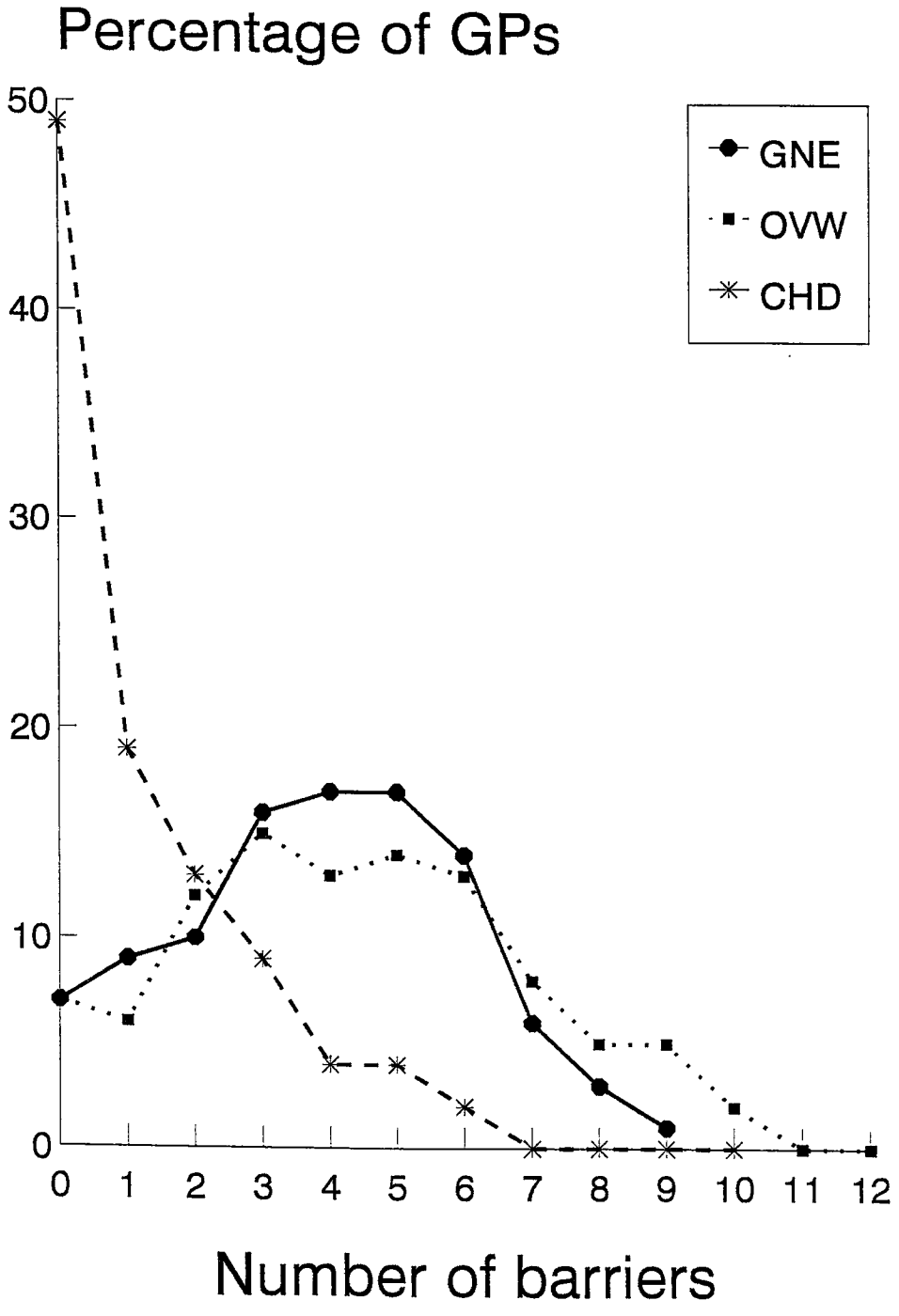
Only 7% of the female GPs and 23% of the male GPs smoke, which is lower than other members of their socio-economic class, of which 26% (females) and 33% (males) smoke (Stichting Volksgezondheid en Roken, 1993a). It is also lower than the smoking behaviour of medical specialists and nurses of the same age group (40-44 years), of which 12% (female) and 37% (males) smoke (Stichting Volksgezondheid en Roken, 1993b).

About 75% of GPs had a 'normal' Body Mass Index: $20 \leq BMI \leq 25$. No female GPs and only 1% of the male GPs had a $BMI > 30$. These findings contrast markedly with the results of a Dutch survey among men and women of 40-44 years of age, of which 10% of the males and 9% of the females had a $BMI > 30$. (National Institute of Public Health and Environmental Hygiene, 1994)

Number of barriers

On the basis of extensive qualitative research barriers were identified as experienced by GPs. The number of barriers in case of general nutrition education (GNE) were 11, in case of treatment of overweight (OVW) 12 and in case of treatment of coronary disease (CHD) 11. Distributions of the number of barriers towards general nutrition education and towards treatment of overweight are remarkably congruent (Fig. 1, page 67), not normally divided, but also not very skew. The distribution of the number of barriers towards treatment of coronary heart disease (CHD) is very skew: 49% of GPs did not perceive any barrier, 19% perceived only one barrier and 33% perceived two or more barriers (Fig. 1, page 67).

Figure 1 Number of barriers GPs perceived to general nutrition education (GNE), to treatment of overweight (OVW) and to treatment of coronary heart disease (CHD).



Barriers towards general nutrition education (GNE)

Questions related to the subject of discussing lifestyle habits and especially dietary practices during consultation were reviewed on perceived barriers. Factor analysis of 11 items identified three main factors (GNE-F1, GNE-F2 and GNE-F3) (Table 1, page 69).

The first factor (GNE-F1) describes barriers which indicate the perception of a personal shortcoming in nutrition knowledge and education. This factor has a high reliability (Cr-α=.76) and was named 'GNE-lack of nutrition training'. The constituent items in this factor are considered as a barrier by 46% to 59% of the GPs.

Factor two (GNE-F2), with a lower reliability (Cr-α=.43), stresses the items task, time and finances as a barrier. This factor was named 'GNE-unfavourable conditions'. The constituent items in this factor are considered as a barrier by 19% to 57% of the GPs with 'lack of time' as the most frequently mentioned barrier (57%).

Finally, factor three (GNE-F3) introduces the opinion of GPs that patients lack the motivation to change either lifestyle or dietary pattern. The constituent items in this factor are considered as a barrier by 9% to 51% of the GPs. This factor was named 'GNE-lack of patient motivation'.

The next question is in which order these GNE-factors indicating perceived barriers by GPs are judged as important ones. 65% of the GPs chose at least one of the items from the factor 'GNE-lack of nutrition training' in their top three barriers. In other words: the factor 'GNE-lack of nutrition training' scores 65% in the top three barriers, the factor 'GNE-unfavourable conditions' 47% and the factor 'GNE-lack of motivation' 43% (Table 2, page 70).

TABLE 1. FACTOR-STRUCTURE IN THE PERCEIVED BARRIERS OF GPs TO GENERAL NUTRITION EDUCATION (GNE), TO TREATMENT OF OVERWEIGHT (OVW) AND TO TREATMENT OF CORONARY HEART DISEASE (CHD). (PERCENTAGES OF 633 GPs)

	FACTOR	BARRIER	FACTOR	BARRIER	FACTOR	BARRIER
ITEMS	GNE	BARRIER TO GNE %	OVW	BARRIER TO OVW %	CHD	BARRIER TO CHD %
Insufficient knowledge in this field	GNE-F1	59	OVW-F1	36	CHD-F1	10
Insufficient skills	GNE-F1	51				
Insufficient knowledge and skills for diagnosis			OVW-F1	6	CHD-F1	10
Insufficient knowledge and skills about effective treatment			OVW-F1	38	CHD-F1	14
Insufficient postgraduate education	GNE-F1	54	OVW-F1	36	CHD-F1	8
I have insufficient self-confidence in this area	GNE-F1	46	OVW-F1	22	CHD-F1	12
Not my task	GNE-F2	20	*	15	*	6
Lack of time	GNE-F2	57	OVW-F2	48	CHD-F2	11
Lack of time to support during treatment			OVW-F2	45	CHD-F2	17
Lack of financial stimulus	GNE-F2	19	*	18	CHD-F2	10
Not enough scientific data available	GNE-F3	21				
Lack of patient motivation	GNE-F3	51	OVW-F3	65	CHD-F2	23
Patients do not complete the course of treatment			OVW-F3	72		
Most methods are either ineffective or counter-productive			*	28		
Intrusion into the privacy of patients	GNE-F3	9				
others	*	4			*	4

GNE-F1: GNE-lack of nutrition training (α=.76) OVW-F1: OVW-lack of treatment skills (α=.76) CHD-F1: CHD-lack of treatment skills (α=.76)
GNE-F2: GNE-unfavourable conditions (α=.43) OVW-F2: OVW-lack of time (α=.74) CHD-F2: CHD-unfavourable conditions (α=.62)
GNE-F3: GNE-lack of patient motivation (α=.23) OVW-F3: OVW-lack of patient motivation (α=.67)
* : item, not part of a factor

TABLE 2. TOP THREE BARRIERS TO GENERAL NUTRITION EDUCATION, TO TREATMENT OF OVERWEIGHT AND TO TREATMENT OF CORONARY HEART DISEASE (PERCENTAGES OF 633 GPs)

GENERAL NUTRITION EDUCATION		TREATMENT OVERWEIGHT		TREATMENT CORONARY HEART DISEASE	
Lack of nutrition training	65%	Lack of treatment skills	43%	Lack of treatment skills	22%
Unfavourable conditions	47%	Lack of time	45%	Unfavourable conditions	33%
Lack of patient motivation	43%	Lack of patient motivation	64%		

(Importance of the barrier-factors expressed as percentage of GPs with item in top three barriers)
* The composition of the factors is given in Table 1 (page 69)

TABLE 3. BARRIER-ITEMS IN TOP THREE BARRIERS (AT ITEM-LEVEL), AS PERCEIVED BY GPs TOWARDS PREVENTION OF OVERWEIGHT (OVW) AND TOWARDS PREVENTION OF CORONARY HEART DISEASE (CHD)

BARRIER-ITEM	PREVENTION OF OVW	PREVENTION OF CHD
Lack of motivation of patients	55%	34%
Patients do not complete the course of treatment	32%	-
Lack of time	39%	28%
Lack of time to encourage during treatment	-	23%

Barriers towards nutrition treatment and prevention of overweight (OVW)

Overweight was chosen as one of the typical cases for GPs because in the treatment of overweight nutrition practices play a central role. Factors indicating barriers are presented in Table 1 (page 69), which results from a factor analysis of 12 items. Three factors were identified as such.

The first factor (OVW-F1) describes barriers which refer to GPs perceiving a personal shortcoming in the treatment of overweight and/or having insufficient self-confidence in this area. This factor has a high reliability (Cr-α=.76) and was named 'OVW-lack of treatment skills'. Only 6% of the GPs perceive 'insufficient knowledge and skills to diagnose overweight' as a barrier. 22% to 38% considered the other items in this factor as a barrier.

Factor two (OVW-F2), with also a high reliability (Cr-α=.76), stresses the items 'lack of time' and 'lack of time to support' as barriers. This factor was named 'OVW-lack of time'. The item 'lack of time' is seen as a barrier by 48% of the GPs.

Finally, factor three (OVW-F3) introduces the opinion of GPs that patients lack the motivation to be treated for overweight and that they relapse during treatment. This factor was named 'OVW-lack of patient motivation' (Cr-α=.67). The two items in this factor are considered by 65% and 72% of the GPs as a barrier.

The factor 'OVW-lack of treatment skills' scores 43% in the top three barriers, the factor 'OVW-lack of time' 45% and the factor 'OVW-lack of patient motivation' 64% (Table 2, page 70).

In addition to treatment of overweight also questions were asked related to prevention of overweight. The top three barriers of GPs to become involved in the prevention of overweight (OVW) are 'lack of motivation of patients' (55% of GPs), 'patients do not complete the course of treatment' (32% of GPs) and 'lack of time' (39% of GPs) (Table 3, page 70). We investigated whether there was a difference between the top three barriers to

treatment of overweight and the top three barriers to prevention of overweight. Only the respondents who marked three most important barriers in both questions were incorporated (N=363). It was found that for an individual GP the top three barriers to treatment of overweight are to a large extent identical to the top three barriers to prevention of overweight (35% of GPs had three equal barriers, 38% had 2 equal barriers and 23% had one equal barrier).

Barriers towards treatment and prevention of coronary heart disease (CHD).

In order to position the GP's role in treatment of coronary heart disease, information was collected on perceived barriers to treatment of coronary heart disease. Factors indicating barriers are presented in Table 1 (page 69), which results from a factor analysis of 11 items. Two factors were identified as such.

The first factor (CHD-F1) describes barriers in relation to perceiving a personal shortcoming of GPs in the treatment of coronary heart disease and/or having insufficient self-confidence in this area. This factor has a high reliability (Cr-α=.76). It was named 'CHD-lack of treatment skills'. The constituent items in this factor are considered as a barrier by 8% to 14% of the GPs.

Factor two (CHD-F2) with a fair reliability (Cr-α=.62), stresses the situational/patient barriers during treatment of CHD. This factor was named 'CHD-unfavourable conditions'. The item 'lack of motivation of patients' was seen as a barrier by 23% of the GPs. The item 'lack of time to support during treatment' was seen as a barrier by 17% of the GPs.

The factor 'CHD-lack of treatment skills' scores 22% in the top three barriers and the factor 'CHD-unfavourable conditions' 33% (Table 2, page 70).

Likewise the treatment of CHD was compared with prevention activities in relation to CHD. The top three barriers experienced by GPs to prevention of coronary heart disease (CHD) are 'lack of motivation of patients' (34% of GPs), 'lack of time' (28%) and 'lack of time to

encourage during treatment' (23%) (Table 3, page 70). A comparable analysis on barriers to treatment of CHD and to prevention of CHD regarding prevention and treatment of overweight could only be done on 91 GPs who, in both fields, marked three most important barriers. It could also be concluded that for an individual GP the top three barriers to treatment of CHD are to a large extent identical to the top three barriers to prevention of CHD (52% of GPs had three equal barriers, 23% had two equal barriers and 13% had one equal barrier).

Integration of results of perceived barriers in the three areas

The factor 'lack of training' appearing as 'GNE-lack of nutrition training', 'OVW-lack of treatment skills' and 'CHD-lack of treatment skills' is a consistent factor over all the data (Cr-α=.81). The correlations between 'GNE-lack of nutrition training', 'OVW-lack of treatment skills' and 'CHD-lack of treatment skills' range from r=.15 (GNE, CHD) to r=.52 (GNE, OVW).

The correlations between 'GNE-unfavourable conditions', 'OVW-lack of time' and 'CHD-unfavourable conditions' range from r=.29 (GNE, CHD) to r=.46 (GNE, OVW). The correlation between 'GNE-lack of patient motivation' and 'OVW-lack of patient motivation' is r=.34.

DISCUSSION

This study has the following characteristics:

- a questionnaire, based on interactive field-research (focus group discussions and in-depth interviews)
- a relatively high net response rate, compared to the literature (Levine et al., 1993; Stott & Pill, 1990; Kelly & Joffres, 1990; Langseth & Gemson, 1991; Murray et al., 1993; Wells et al., 1984; Jack et al., 1990) due to carefully planned supportive communication (Dillman, 1978)
- scales, constructed on the basis of well-interpretable factor-analyses
- a very low item non-response (1.6%)
- results which can be generalized to Dutch GPs, in practice between 5 and 15 years.

Whether or not GPs give nutrition information to their patients will depend on a number of factors such as, for example, their interest in the role of diet on health, their perception of their task and their beliefs about the ability and willingness of patients to change their lifestyle and dietary habits. However, two aspects which involve interest and barriers for GPs clearly came to the fore. 70% of them claimed to be interested in the contribution of diet to health. With regard to barriers 65% expressed lack of nutrition training as a barrier, 47% 'unfavorable conditions' (e.g. lack of time), and 43% lack of motivation of patients (Table 1, page 69).

It was found that 28% of GPs gave nutrition information daily to about 10% of their patients, and 46% did so daily to about 5% of their patients. This means that about three quarters gave nutrition information to 1-6 patients a day. These findings are comparable with results in other studies. Kelly & Joffres (1990) reported 25% of GPs gave dietary advice at least once a day. 66% of the health professionals -including GPs- quoted by Murray et al.

(1993) reported giving dietary advice between one and four times a day.

Personal health habits are often considered as barriers to health promotion behaviour (Nutting, 1986; Wells et al., 1984; Henry et al., 1987). At least it is promising to note that Dutch GPs smoked less than their socio-economic class peers and that they had a very low percentage of high Body Mass Indexes (>30) compared to the Dutch population as a whole.

Although the rather broad and general dietary guidelines were only recognized by about 30% of GPs, this does not necessarily mean that they do not use them. In this respect, the nutrition consultation media are important. When GPs do not have enough nutrition knowledge to be able to give nutrition advice to their patients, then the consultation media could be part of the solution, as could nutrition training through inter-active distant-learning.

The most powerful weapon to help patients change their behaviour with regard to nutrition, is, in principle, communication with the GP. If GPs could see themselves as being more effective, they would probably apply their knowledge and skills (Jack et al., 1990). It would seem appropriate to convince GPs that they may underestimate themselves, because even brief interventions by them, could affect the lifestyle of their patients (Kelly, 1988).

This study systematically analyses barriers perceived by GPs in the broad field of general nutrition education, in which the dimensions of barrier-items were constructed with factor-analysis and in which the top three barrier variables were measured to obtain good insight into the relative importance of the different barrier variables (Table 2, page 70).

Integration of results of perceived barriers shows in the first place that the factor 'lack of training' appearing as 'GNE-lack of nutrition training' (Cr-α=.76), 'OVW-lack of treatment

skills' (Cr-α=.74) and 'CHD-lack of treatment skills' (Cr-α=.76) is a consistent factor over all the data, with a high reliability (Cr-α=.81). These results strongly support the fact that nutrition should belong to the core subjects in the medical curriculum. We further strongly recommend that the possibilities for other ways of increasing the nutrition knowledge in GPs, for instance via an interactive distant learning programme for GPs in practice, should be reviewed.

Secondly: 'unfavourable conditions'. A very important constituent of the factor 'unfavourable conditions', both in GNE and in treatment of CHD is 'lack of time' (Table 2, page 70). 'Lack of time' is a variable with rather unclear features; it stresses the conflict of everyday practice between the urgent curative care and preventative activities.

Thirdly, 'lack of patient motivation'. This factor scores 64% in the top three barriers to treatment of overweight, 43% in the top three barriers to GNE, and it scores as an item in the top three barriers to treatment of CHD at only 20%. This may indicate that GPs must have an understanding of social psychological principles on how to motivate patients to change their behaviour, and they should get a minimum of training on how to deal with these principles when dealing with patients.

49% of GPs had no barrier to treatment of CHD and 19% indicated only one barrier. This may reflect that the 'Cholesterol Consensus' is well known by GPs in the Netherlands (Grol & Heerdink, 1992) and that this observation is similar to the situation in the United States, as reported by Schucker et al. (1987a; 1987b; 1991). Our findings that the top three barriers to prevention of overweight are to a large extent identical to the top three barriers to treatment of overweight, and the same situation observed for treatment and prevention of coronary heart disease are of utmost importance for the planning of nutrition instruction and information to GPs, and for formulating a national nutrition information policy.

Our result that 'lack of time', at item-level, was a very important barrier of GPs to GNE (Table 1, page 69), confirms the results of Kelly & Joffres (1990). Lack of time has often been reported as a perceived barrier to health promotion and health education (Boulton & Williams, 1983; Orleans et al., 1985; Kelly & Joffres, 1990; Langseth & Gemson, 1991; Wells et al., 1984; Henry et al., 1987; Lazarus et al., 1993). Kottke et al. (1984) found 'lack of patient motivation' the most important barrier to giving nutrition education; in our study it was the third important barrier to GNE (Table 2, page 70). Our finding that 'lack of patient motivation' was the most important barrier to treatment of overweight (Table 2, page 70) and the most important barrier (item-level) to treatment of CHD confirms the results of Henry et al. (1987) for overweight and of Kottke et al. (1984) for treatment of CHD. Mann & Putnam (1989) reported that physicians perceived themselves least skilled in enhancing patient compliance and achieving behaviour change.

Are the results generalisable to other countries? The results will be influenced by the existing primary health-care system and by the role of the general practitioner in this system. Within the countries of the European Community there are major differences in these matters (Mant, 1994). Anglo-Saxon and some Scandinavian countries strongly resemble the Dutch traditional general practice with a strong gatekeeper role to secondary care and a registered list of patients; we expect that for these countries the results will be well generalisable. For other countries, with more resemblance to the American system of primary health-care and hardly any gatekeeper role of the general practitioner we expect that our results might be less generalisable.

In conclusion, our data show clearly that there are barriers in GPs that have a negative influence on the nutrition promotion activities in dealing with patients. The next step will be to develop interventions in order to see whether GPs performance in this field can be

improved. Priority should be given to increase GPs knowledge on the important role of nutrition in health. At the same time, attention should be given to teach GPs about the role of attitudes and behaviour involved in changing a persons dietary pattern.

ACKNOWLEDGEMENTS

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Chapter 4

DRIVING FORCES AND BARRIERS OF NUTRITION GUIDANCE PRACTICES OF DUTCH PRIMARY-CARE PHYSICIANS

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ABSTRACT

Aims - To analyse determinants of nutrition guidance practices of primary care physicians (PCPs).

Methods - Identification of determinants of nutrition guidance practices by means of multiple linear regression analysis.

Sample - 1000 PCPs in practice for between 5 and 15 years.

Design - Mail questionnaires (result of focus group discussions and in-depth interviews) were sent to a nationwide random sample of PCPs in the Netherlands.

Key results - Net response rate was 64%. Perceived barriers were identified, which influence nutrition guidance practices in a negative way. We did also identify driving forces at PCPs, which acted positively on nutrition guidance practices. Driving forces in PCPs are: an active interest in the effect of nutrition in health and disease, a basic level of nutritional knowledge and positive attitudes towards nutrition guidance practices.

Conclusion - Although perceived barriers can be strong negative determinants of being involved in nutrition guidance practices, it may become more important to stress in future the driving forces which positively determine involvement of PCPs in nutrition guidance practices.

Keywords: primary care physician, determinants, nutrition guidance practices, nutritional attitudes and beliefs, nutrition interest.

INTRODUCTION

Levine et al. [1] observed that the clinical practices of primary care physicians (PCPs) related to nutrition are well below a minimum level as defined by Young et al. [2] Levine et al. [1] also found favourable attitudes of PCPs towards using nutrition guidance in their practice; however, these attitudes were not consistent with the PCPs' clinical reports. The determinants of nutrition guidance practices of PCPs are poorly understood. Only studies to search for determinants of nutrition guidance practices of primary care physicians have been carried out, identifying perceived barriers of PCPs [3-9] or addressing themselves to specific areas, for example cardiovascular risk reduction. [10, 11] The key question however is what kind of predisposing, enabling and reinforcing factors [12] are playing a role when PCPs offer nutrition guidance to their patients.

In order to improve patient nutrition guidance practices by primary care physicians, information is needed about factors which determine these nutrition guidance practices. This study was designed to analyse nutrition guidance practices of PCPs, their nutritional attitudes, their nutritional knowledge and their interest in the role of nutrition in health and disease.

METHODS

A random sample of 1000 primary care physicians was drawn from the 2798 PCPs in the Netherlands who had been practising for the past 5 to 15 years [13]. In October 1992, the 1000 PCPs were sent a specially developed mail questionnaire (the Wageningen GPs Nutritional Practices Questionnaire), based on methodology described by Dillman [14]. After the initial personal letter and questionnaire, a personal follow-up letter was sent every two weeks (three times), if necessary. After eleven weeks, the first telephone reminders were started (maximum three reminders).

The Wageningen questionnaire was based on qualitative research (focus group discussions and in-depth interviews) and consisted of issues such as:

- task perception as primary care physician;
- sources of information on nutrition;
- dealing with nutrition education in practice (nutrition guidance practices) and
- the barriers to be coped with (e.g. lack of time).

Special attention was given to two typical examples of nutrition guidance: treatment and prevention of overweight, and top of coronary heart disease. Items asked as possible barriers were taken from the literature and from previous qualitative research. Attitudinal and behavioural questions were scored on a five point Likert scale [14], unless otherwise stated. To improve the content validity of the questionnaire, two health education and extension experts and four nutritionists (faculty members), one primary-care physician, one staff member of the Dutch College of General Practitioners and two senior market research officers were continuously involved during its development.

The nutrition guidance practices which act as dependent variables are a) intensity of nutrition education and information, b) degree of use of official nutrition information materials and c) noticing patients' overweight and guidance of treatment. The variable intensity of nutrition

education and information was scored on a 5 points Likert type scale, ranging from 'not at all' to 'very intense'. The variable degree of use of official nutrition information materials is based on six items which provide information about amount of use of Dietary Guidelines of the Dutch Nutrition Council [15] and of several leaflets such as made available by the Netherlands Centre of Nutrition Education based on these guidelines [16], as well as the active versus passive way they are used (α=.75).

The variable noticing patients' overweight and guidance of treatment was operationalized in six items (α=.66). One item addresses the percentage of patients of whom the PCP notices their weight. Five items are about guidance of treatment: three items concerning the discussion of overweight problems and two items concerning the extent of the advice.

As possible determinants of these nutrition guidance practices are chosen general and personal characteristics of the respondents, perceived barriers and nutritional attitudes and beliefs.

STATISTICS

The principal components analysis with varimax rotation (factor analysis) was used for scale construction [17]. Skewed distributions were normalized by square root transformation. Factors were calculated as weighted sums of items, according to scale width. Crohnbach's α was used as a measurement of reliability of scales derived from factor analysis. Determinants of nutrition guidance practices were analysed by multiple regression analyses [17] using the Bonferroni correction in the stepwise procedure, as modified by Holms [18]. The Adjusted R Square indicates the percentage of explained variance.

Because of correlations between the independent variables, forward multiple regression analysis as well as backward multiple regression analysis were performed in all cases to check the stability of the solution. Associations were studied using Pearsons correlations test.

RESULTS

PARTICIPANTS and response

Characteristics of the 633 PCPs who responded to the questionnaire are summarized in Table 1 (page 88). The net response rate was 64%. The 633 respondents were well representative of the population of PCPs who had been in practice for between 5 and 15 years according to sex, year of starting practice and sex by type of practice distribution. The mean item non-response in our survey was very low: 1.6% [14]. The mean time needed to complete the questionnaire was 41 minutes.

Seventy percent of PCPs in our study claimed to be interested in the effect of nutrition on health (and 25% said they were 'neutral' in this respect).

TABLE 1 Characteristics of 633 respondents and their practices

- Gender	114 female (18%) 519 male (82%)
- Age (mean ± SD)	41 ± 4 years
- Mean time in practice	11 years (range 5-15)
- Mean practice list	almost 2300 patients
- Mean number of patients a day	35
- Planned time per consultation	10 minutes
- Situation of practice - urban/rural	81% urban, 19% rural
- Type of practice	44% solo, 36% duo, 20% group
- Practice in health centre	90% not; 10% yes

DETERMINANTS of nutrition guidance practices

The analyses of determinants of nutrition guidance practices by PCPs are based in the first place on perceived barriers. These barriers (with a relatively high Crohnbach's alpha) are

given in Table 2 (page 89). It is clear from these barriers that PCPs do not perceive themselves to be well-trained and educated in nutrition. It is also found that PCPs judge themselves to lack skills in treating overweight and even coronary heart disease.
Secondly, the general characteristics of the respondents and their practices (Table 1) and personal characteristics of the respondents (Table 3, page 90) were also used in this analysis. Thirdly, available information about nutritional attitudes and beliefs of PCPs (Table 4) was also used in the analysis of determinants. The main factors found after factor analysis in the field of nutritional attitudes and beliefs of PCPs are given in Table 4 (page 91). They have relatively high Crohnbach's alpha's.

TABLE 2 Perceived barriers to nutrition guidance practices

Description	α [1)]	item[2)]
Lack of nutrition training and education	.76	4
Lack of skills to treat overweight	.65	5
Lack of time to treat overweight	.74	2
Lack of patient motivation to reduce overweight	.67	2
Lack of skills to treatment of coronary heart disease	.76	5
Unfavourable conditions to treat coronary heart disease	.62	4

[1)] Crohnbach's alpha, a measure of reliability of the factors

[2)] number of items constituting a factor

In the following paragraphs an in-depth analysis will be presented related to nutrition education and the use of nutrition education material. Because PCPs experience serious barriers in the treatment of overweight this topic will also be reviewed in detail and must be seen as a specific case analysis.

TABLE 3 Personal characteristics of 633 respondents

Body Mass Index of PCP (kg/m^2)
Smoking behaviour of PCP (yes, no longer, no)
Use of dietary supplements or diet/particular nutritional regime: 0 = none, 1 = one of both, 2 = both
Interest of partner of PCP in health aspects of nutrition
Partner of PCP keeps to a diet or particular nutritional regime: 0 = not, 1 = yes
Patient register system used by PCP
Number of organizations contacted during the last two years for nutrition information
Contact with dietician during the last 2 years for nutrition information
Literature searched for nutrition information during the last 2 years
Interest in the effect of nutrition on health
Implementation in own practice of 8 ways of nutrition education
Attitude on the role of diet in CVD
Attitude about weight-health relationship
Number of Voedings Magazines read from the last 6 issues

TABLE 4 Factors in the fields of nutritional attitudes and beliefs (all results of factor-analysis)

Description	α [1]	item [2]
Task perception	.69	24
Awareness of information and educational possibilities of nutrition education organizations	.84	8
Awareness of the content of National Dietary Guidelines, of educational material based on these guidelines of the Centre for Nutrition Education, and of the Standard Cholesterol Protocol of the National Association of General Practitioners.	.75	3
Maximum acceptable weight for ♀/♂ with defined length and age, translated in BMI classes	.72	2
Perception of the role of behaviour and heredity on health	.73	7
Perception of difficulty of patients with health problems to adjust their way of life and their eating habits	.78	2
Ability to influence the lifestyle and eating habits of patients with health problems	.85	2
Attitude regarding treatment of overweight	.65	5
Appreciation of Standard Cholesterol Protocol and its applicability	.74	2
Perception of own ability to give dietary advice in the treatment and prevention of coronary heart disease	.70	2
Opinion about effectivity and applicability of different ways of providing nutrition education to the public/patients	.70	2
Opinion about effectivity of obtaining adequate nutrition education by congresses or educational courses	.78	4
Opinion about effectivity of obtaining adequate nutrition education through scientific journals, popular scientific journals, nutrition magazines, brochures	.73	8
Opinion about effectivity of obtain adequate nutrition education by video or interpersonal communication	.72	6
Perception of nutrition importance in future	.77	6
Workload (function of number of patients in practice and number of patients seen per day)	.72	2

[1] Crohnbach's alpha, a measure of reliability of the factors
[2] number of items constituting a factor

INTENSITY of nutrition education and information

The outcome of analysis via multiple regression leads to the following explanation of the variable intensity of nutrition education and information (5 points Lickert type scale, ranging from not at all to very intense) (Table 5, page 93).

It is found that eight variables explain 32% of the variance. Of these eight variables two belong to the category of perceived barriers by PCPs, which are lack of nutrition training and lack of time to treat overweight. These variables score negative. The other six variables score positive and can be considered as motivating factors or driving forces. This means that PCPs involvement in giving patients dietary guidance depends on variables such as task perception, nutrition interest and perception of their own ability to influence lifestyle and eating habits of patients with health problems. No sign of multicollinearity was found when studying partial correlation coefficients with nutrition education and information.

DEGREE of use of official nutrition information materials

The level of enrolment of PCPs in patient nutrition guidance depends not only on their level of nutrition education but also whether they keep themselves actively involved in obtaining new information and in actively implementing this information.

We have analysed the determinants of the so-called variable 'degree of use of official nutrition information materials'.

The findings based upon multiple regression analysis (forward and backward) show that an active involvement of PCPs in obtaining new nutrition information and also to apply it exerts a positive influence and can be seen as a driving force (Table 6, page 93).

Five factors together explain 29% of the variance. All five exert a positive influence and can therefore be considered as driving forces. Again, no sign of multicollinearity was found when studying partial correlation-coefficients with nutrition information usage.

TABLE 5 PCPs and factors determining their **intensity of nutrition education and information of patients.**

FORWARD SOLUTION ≡ BACKWARD SOLUTION	ß[1]	P[2]
Lack of nutrition training	—.18	xxx
Lack of time to treat overweight	—.17	xxx
Task perception	.18	xxx
Perception of own ability to influence life style and eating habits of patients with health problems	.16	xxx
Nutrition interest	.15	xxx
Treatment of cardiovascular diseases:		
- Perception of own ability to give dietary advice in treatment and prevention of CVD	.12	xxx
- Attitude on the role of diet in CVD	.12	xxx
- Appreciation of a standard cholesterol protocol	.12	xx
	Multiple R Explained variance	=.58 = 32%

1) The coefficient ß of an independent variable shows the direction and relative contribution of that independent variable to the explanation.
2) P is the P-value for the test of regression coefficient equals zero.
   P < 0.001 : xxx
   P < 0.01 : xx

TABLE 6 PCPs and factors determining their **degree of use of official nutrition information materials.**

FORWARD SOLUTION ≡ BACKWARD SOLUTION	ß[1]	P[2]
Awareness of content of dietary guidelines/advice on nutrition	.27	xxx
Nutrition organization contacts in last two years	.21	xxx
Implementation in own practice of different ways of nutrition education	.14	xxx
Perception of nutrition importance in future	.12	xx
Awareness of information of nutrition education organizations	.13	xx
	Multiple R Explained variance	=.54 = 29%

1) The coefficient ß of an independent variable shows the direction and the relative contribution of that independent variable to the explanation.
2) P is the P-value for the test of regression coefficient equals zero.
   P < 0.001 : xxx
   P < 0.01 : xx

NOTICING patients' overweight and guidance of treatment

In addition to variables related to general nutrition education and use of nutrition information materials by PCPs, an in-depth subject analysis was made of the factor noticing patients' overweight and guidance of treatment.

It is found that five factors together explain 25% of the variance (Table 7). No sign of multicollinearity was found when studying partial correlation-coefficients with notice of weight. The variable noticing patients' overweight and guidance of treatment can be explained by the factors task perception, attitude regarding the treatment of overweight, attitude towards weight-health relationship, type of practice and perception of the role of behaviour and heredity on health. All variables exert a positive influence (and therefore again can be seen as motivating factors or driving forces). PCPs in group and duo-practice have a higher score on the variable noticing patients' overweight and guidance of treatment than PCPs in solo practice.

TABLE 7 PCPs and factors determining their **noticing patients' overweight and guidance of treatment.**

FORWARD SOLUTION = BACKWARD SOLUTION	ß[1]	P[2]
Task perception	.31	xxx
Attitude regarding the treatment of overweight	.22	xx
Perception of role of behaviour and genome on health	.13	xxx
Type of practice (solo, duo, group)	.10	xx
Attitude towards weight-health relationship	.10	xx
	Multiple R = .51 Explained variance = 25%	

1) The coefficient ß of an independent variable shows the direction and the relative contribution of that independent variable to the explanation.
2) P is the P-value for the test of regression coefficient equals zero.
P < 0.001 : xxx
P < 0.01 : xx

DISCUSSION

Thusfar, the role of PCPs in nutrition guidance is often seen in a negative way (perceived barriers and lack of interest of PCPs). The result of this view is that it seems that the profession is hardly involved nor interested in nutrition. Of course we observed perceived barriers to nutrition guidance practices (Table 2) in our study on nutrition guidance practices of primary care physicians, as is also found in several other studies [3-9]. However in addition we did identify a number of factors which positively act as driving forces in PCPs and which bring them involved in nutrition guidance practices. These driving forces are factors such as a positive interest in the effect of nutrition in health and disease, a basic level of nutritional knowledge, and positive personal attitudes towards nutrition practices. In the following paragraphs we will especially discuss these driving forces for several dietary guidance practices.

The most important nutrition guidance practice variable of PCPs we tried to explain is intensity of nutrition education and information of their patients. Driving forces in PCPs observed were a positive task perception, an active interest in the effect of nutrition in health and disease and other positive nutritional attitudes and beliefs. Together with the observed perceived barriers lack of nutrition training and lack of time to treat overweight they are major determinants of the extent to which PCPs give dietary guidance in daily practice (Table 5, page 93). These findings are of utmost importance for the improvement of patient nutrition guidance practices of PCPs. With regard to the three driving forces in the field of coronary heart disease, it is important to appreciate that the cholesterol standard protocol is well known by PCPs in the Netherlands [20] and that the majority of PCPs are of the opinion that this protocol is applicable in their practice (85%). This situation is similar to the situation in the United States, as reported by Schucker et al. [21, 22].

The variable noticing patients' overweight and guidance of treatment can be explained by driving factors such as a positive task perception, a positive attitude regarding the treatment of overweight, a positive attitude towards weight-health relationship and a positive perception of the role of behaviour and heredity on health (Table 7, page 94). The more the PCPs in this study are convinced that physical activity, stress, hygiene, dietary pattern, alcohol use, smoking and heredity are important for health, the higher their score on the variable noticing patients' overweight and guidance of treatment. Personal health habits are often considered as barriers to health prevention behaviour[4, 7, 8]. This study shows that the attitude of the PCP towards his or her own body weight, watching it carefully, correlates positively with a good score of the variable noticing patients' overweight and guidance of treatment.

The extent to which PCPs are interested in the effect of nutrition on health plays as a driving force an important role in the explanation of the extent to which PCPs give dietary guidance in daily practice and of noticing patients' weight and guidance of treatment. Seventy percent of PCPs in our study claimed to be interested in the effect of nutrition and health (and 25% said they were 'neutral' in this respect). This is important, because after awareness (proven by Table 2), interest is the second essential step in the process of diffusion of innovations[23]. Without interest, further steps in this process are impossible.

The perceived barriers (Table 2), as well as the factors in the fields of nutritional attitudes and beliefs (Table 4) all have relatively high Crohnbach's alphas, which is possibly partly the result of the previous qualitative research (focus group discussions and in-depth interviews) and some pilot-studies.

Inherent to mail questionnaires is that all data are based on self-report. Theoretically, there is always a gap between the report of the primary care-physician and the factor behaviour

itself. Eventually, wrong answers, given consciously or unconsciously, will lead to misclassifications, thereby reducing the percentage of explained variance in the multiple regression analysis of nutrition guidance practice variables. In this light, the percentages of explained variance of the nutrition guidance practice variables are relatively high.

In all cases, the forward solution of the multiple regression analysis was identical to the backward solution. And also in all cases there was no sign of the phenomenon of multicollinearity when studying partial correlations with the variable to be explained. It seems therefore that the interpretation is univocal.

There are reports in the literature that the longer the PCPs have been in practice, the lower their nutrition knowledge[24, 25]. We did test whether PCPs were aware of the content of dietary guidelines/advises on nutrition and found no correlation with age (or year of starting practice).

PCPs probably do not make sufficient use of the opportunities for health education on nutrition in their consultations[25]. Such a situation is regrettable, as there is increasing evidence that quality of life depends for a significant part on adequate food and nutrition practices[26]. This is especially true as PCPs are becoming more and more the principal gatekeepers to healthy lifestyles. As such they are perceived as the best and most credible source of health information and, after the media, the source most often used[3, 4, 25, 27, 28]. In view of the findings that were obtained in this study, we might conclude that PCPs are a fertile soil to become more involved in nutrition guidance of their patients. The first two essential steps in the process of diffusion of innovations[23] - awareness and interest - have already been taken by PCPs. They still need competency based training in nutrition issues relevant for patient guidance; thereby the emphasis is placed on the learner and the learning

process, the needs and accomplishments of the learner. If we are successful in such training the PCPs involvement in nutrition will grow. Therefore, priority should be given now to increase PCPs knowledge on the role of nutrition in health and disease. This must be done at medical school (preferably by a physician nutrition specialist)[29] but surely also for PCPs in practice.

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Chapter 5

NUTRITION GUIDANCE OF PRIMARY-CARE PHYSICIANS: LISREL-ANALYSIS IMPROVES UNDERSTANDING

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ABSTRACT

Background - When determinants of nutrition guidance practices of primary-care physicians (PCPs) are identified[15], then the key question still is: what is the mechanism of action? This knowledge is necessary in order to understand how PCPs do practice nutrition guidance.

Methods - Mail questionnaires (result of focusgroup discussions and in-depth interviews) were sent to a nationwide random sample of 1000 PCPs in the Netherlands, in practice for between 5 and 15 years (633 respondents). The mechanism of action of determinants of nutrition guidance practices of PCPs was identified by means of linear structural relationship analysis (LISREL) using a postulated model.

Results - The postulated model on the mechanism of action (Figure 1) was confirmed. The model states that nutrition guidance practices of PCPs are directly and significantly based on a small number of predisposing factors; driving forces and perceived barriers may act as significant intermediary variables. The predisposing factors, driving forces and perceived barriers were identified.

Conclusion - Policies to improve nutrition guidance practices of PCPs might in future benefit from a LISREL-model analysis of determinants of these practices to become more effective. If multiple regression analysis is used to ascertain the determinants of these practices, this might lead to a missing of important predisposing factors and of 'hidden' intermediary factors and therefore to an incomplete understanding of the mechanism of action.

INTRODUCTION

The involvement of primary-care physicians (PCPs) in nutrition guidance practices appears to be very low[1,2]. Levine et al.[1] observed that the clinical practices of PCPs related to nutrition are well below a minimum level as defined by Young et al[3]. These authors found that favourable attitudes of PCPs towards using nutrition guidance in their practice were not consistent with PCPs clinical reports. The determinants of nutrition guidance practices of PCPs are poorly understood. So far studies searching for determinants of nutrition guidance practices of PCPs have been limited to identifying perceived barriers of PCPs[2,4-10] or by addressing specific areas, such as cardiovascular risk reduction[11-13]. We have found that nutrition guidance practices of Dutch PCPs are determined on the one hand by a number of perceived barriers such as lack of nutrition training and education and lack of time[14,15] and on the other hand by some driving forces, such as an active interest in the effect of nutrition in health and disease15. We now have performed an in-depth analysis of the mechanism of action of determinants of nutrition guidance practices of PCPs. A better understanding of this mechanism might be of great help when planning interventions to improve the nutrition guidance practices of PCPs[16]. In this article, we present LISREL-models on factors influencing nutrition guidance practices in Dutch PCPs.

METHODS

Sample

A random sample of 1.000 primary-care physicians was drawn from the 2798 PCPs in the Netherlands who had been practising for between 5 and 15 years. In October 1992, the 1000 PCPs received a specially developed mail questionnaire (the Wageningen GPs Nutritional Practices Questionnaire), based on the methodology of Dillman[17] as described earlier[14]. The Wageningen questionnaire was based on qualitative research (focus group discussions and in-depth interviews) and consisted of issues such as: personal characteristics; description of the practice; task perception as primary-care physician; sources of information on nutrition; nutrition guidance practices and the barriers to be coped with (f.e. lack of time). Special attention was given to two typical examples of nutrition guidance relevant behaviour: treatment and prevention of overweight and coronary heart disease.

TABLE 1: Characteristics of 633 respondents and their practices

- Gender	114 female (18%) 519 male (82%)
- Age (mean ± SD)	41 ± 4 years
- Mean time in practice	11 years (range 5-15)
- Mean practice list	almost 2300 patients
- Mean number of patients a day	35
- Planned time per consultation	10 minutes
- Situation of practice	81% urban, 19% rural
- Type of practice	44% solo, 36% duo, 20% group

The items which were asked as possible barriers came from the literature and from previous qualitative research. Attitudinal and behavioural questions were scored on a five point Likert scale[14], unless stated otherwise.Characteristics of the 633 PCPs who responded to the questionnaire are summarized in

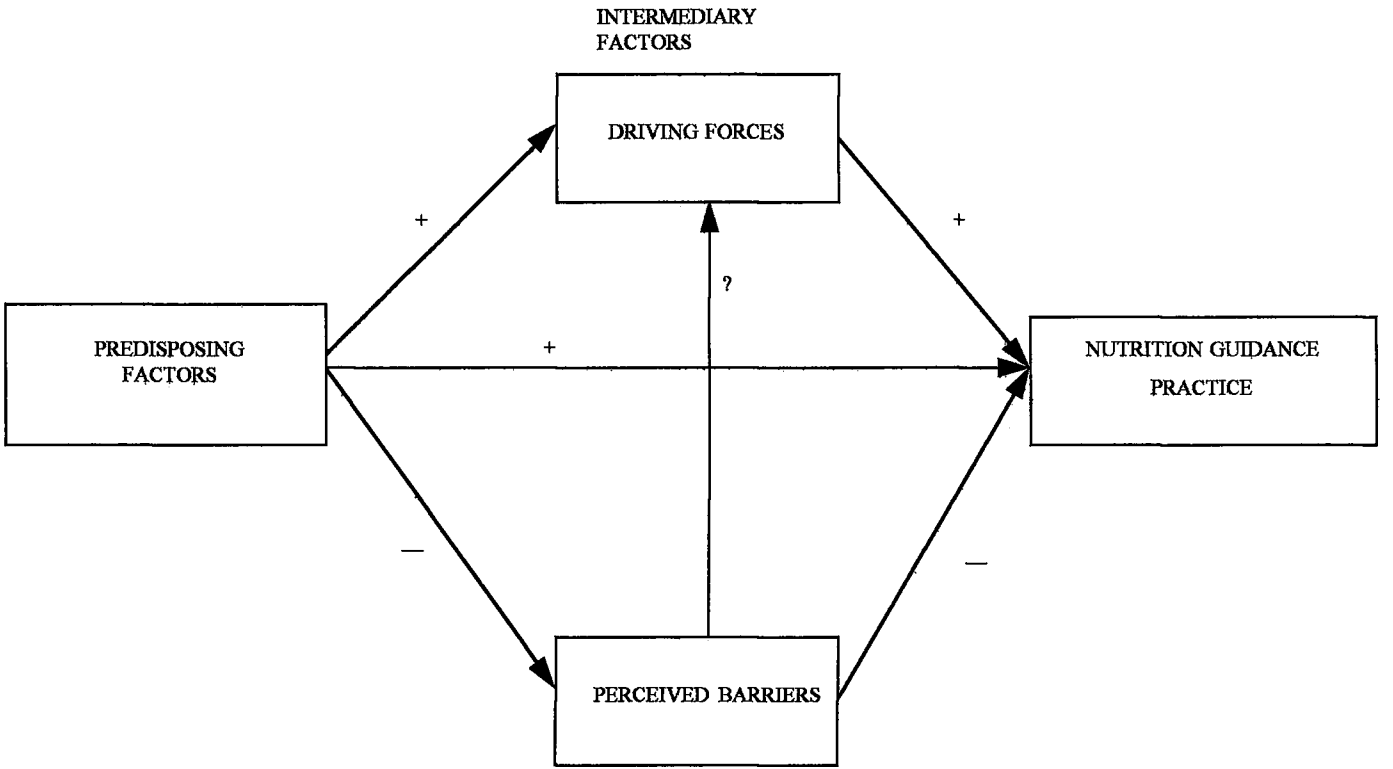
Table 1 (page 106). The net response rate was 64%. The 633 respondents were well representative of the population of PCPs who had been in practice for between 5 and 15 years according to gender, year of starting practice and gender by type of practice distribution[14]. Seventy percent of PCPs in our study claimed to be interested in the effect of nutrition on health (and 25% said that they were 'neutral' in this respect)[14].

Hypothesis

Our hypothesis is shown in Figure 1 (page 108). In this general model the nutrition guidance practices of PCPs (dependent variable) are determined by a mechanism in which the predisposing factors, with or without the intermediary factors (driving forces and barriers) play a major role. The arguments for this postulation are based upon the predisposing, enabling and reinforcing factors of Green & Kreuter in their PRECEDE-PROCEED model[16], and upon our previous qualitative research. In addition, we hypothesize that barriers will have a negative effect on driving forces.

As dependent variable in the general model is in the first place tested the variable 'intensity of nutrition education and information of PCPs'[14] and in the second place the PCPs involvement of 'noticing overweight in patients and the given guidance of treatment'[14]. These variables were chosen as the two most important behaviour variables, out of the nutrition guidance variables studied thus far[15].

Figure 1: Postulated general model of mechanism of action of determinants of nutrition guidance practices of PCPs (+ = positive effect, - = negative effect)



Dependent variable intensity of nutrition education and information

The variable 'intensity of nutrition education and information which PCPs give to their patients' was scored in one question on a five-point Likert-type scale, ranging from 'not at all' to 'very intense'.

The analysis of focus group discussions and in-depth interviews with PCPs revealed the following four predisposing factors for this dependent variable:

- perception of own ability to influence lifestyle and eating habits of patients with health problems (which is a self-efficacy factor)[16,18-20];
- interest in the effect of nutrition in health and disease
- perception of own ability to give dietary advice in the treatment and prevention of coronary heart disease (which is also a self-efficacy factor[16,18-20]).
- perception of role of behaviour and heredity on health.

We analysed whether these predisposing factors act directly on the dependent variable and/or whether driving forces or barriers act as intermediary variables.

Dependent variable noticing patients' overweight and guidance of treatment

The variable 'noticing patients' overweight and guidance of treatment' was operationalized in six items. One item addresses the percentage of patients of whom the PCP notices their weight. Five items are about guidance of treatment: three items concerning the discussion of overweight problems and two items concerning the extent of the advice. The analysis of focus group discussions and in-depth interviews identified the same four predisposing factors for this dependent variable as for the dependent variable intensity of nutrition education and information discussed above. We also analysed whether these predisposing factors act directly on the dependent variable and/or whether driving forces or barriers act as intermediary variables.

Statistics

The principal components analysis with varimax rotation (factor analysis) was used for scale construction[21]. Skewed distributions were normalized by square root transformation. Crohnbach's α was used as a measurement of reliability of scales derived from factor analysis. Factors were defined as sums of items, standardized for scale width. Differences between the predisposing factors in effect on the dependent variable were tested with the student's t-test.

For the identification of the mechanism of action of determinants of the dependent variables linear structural relationships analysis (LISREL path analysis) was used (program version 7.16, Jöreskog and Sörbom,[22]). When the conditions of a) low residuals, b) all t-values of effects >2 and c) an acceptable Q-plot of all standardised residuals are fulfilled[22], the LISREL-solution was accepted. χ^2_{DF}, P, adjusted goodness of fit index (AGFI) are presented to indicate the quality of the model.

RESULTS

Dependent variable intensity of nutrition education and information

The 16 factors used in the LISREL-path analysis for analyzing the dependent variable 'intensity of nutrition education and information by PCPs' (Crohnbach's α=.66) are given in Table 2 (page 112). Of these 16 factors, 9 factors do have a high Crohnbach's alpha and two factors do have a moderate Crohnbach's alpha. The other five factors were based on one question.

The hypothesis that the dependent variable is determined by the predisposing factors, with or without intermediary factors could be confirmed because the LISREL-program provided a model with an excellent fit[22] (Figure 2, page 113)). The obtained model does fit with the empirical data ($\chi^2_{DF=25}$=31.13, P=.185); the adjusted goodness of fit index (AGFI)= .977. The percentage of explained variance in 'the intensity of nutrition education and information' by the LISREL-model is 33% (which is in good agreement with the 32% obtained by multiple regression analysis[15]).

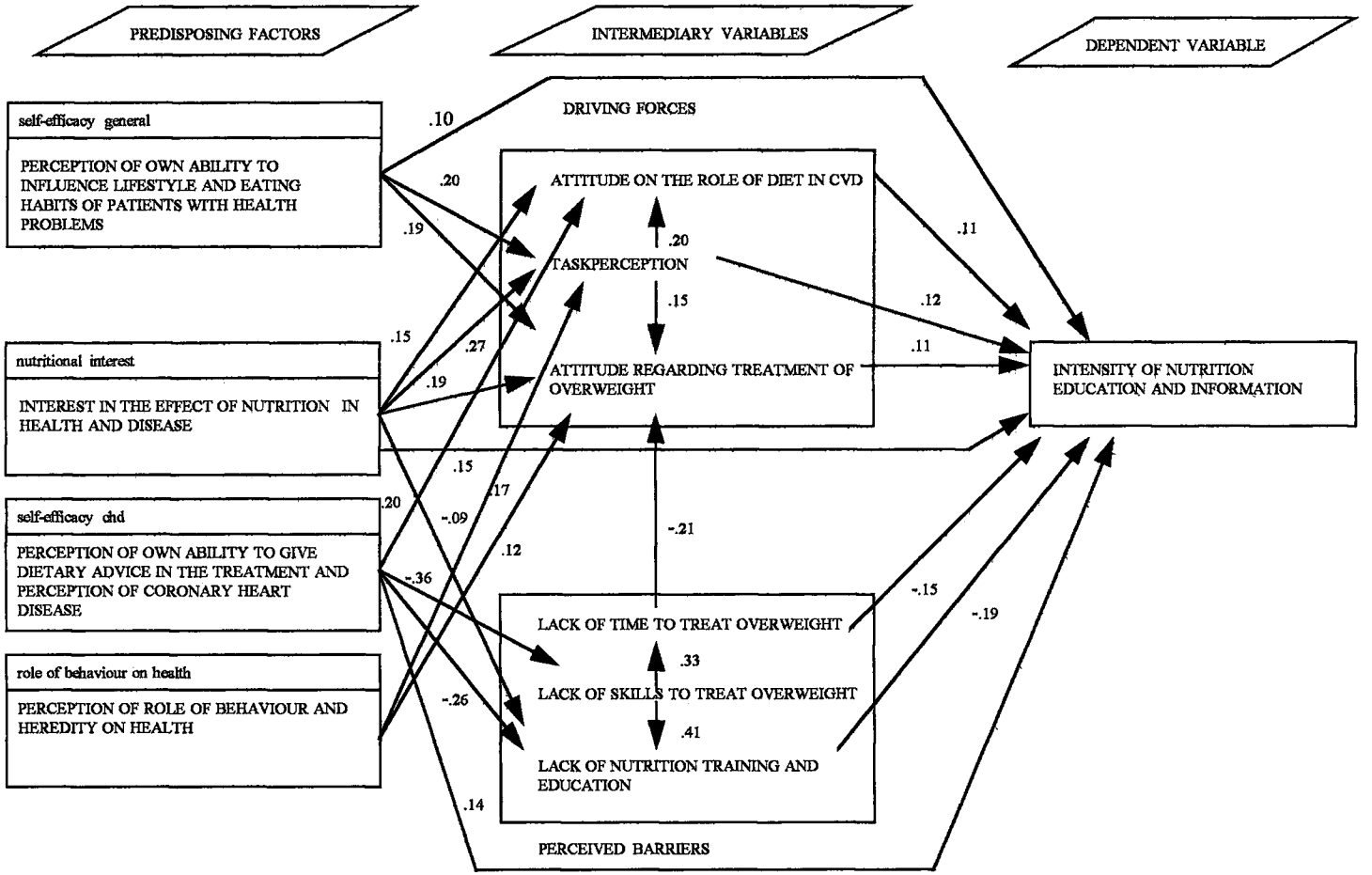
From the LISREL model of Figure 2 it also becomes clear that the following three predisposing factors: perception of own ability to influence lifestyle and eating habits of patients with health problems (self-efficacy general); interest in the effect of nutrition in health and disease (nutritional interest); perception of own ability to give dietary advice in the treatment and prevention of coronary heart disease (self efficacy chd) act both directly on the dependent variable and indirectly via two main intermediary variables which are driving forces and/or barriers. The predisposing factor perception of role of behaviour and heredity on health (role of behaviour on health) only acts via intermediary variables. The influences of these four predisposing factors on the dependent variable are given in Table 3 (page 116). It is found that the direct effects provide more than half of the total effects (52-66%).

TABLE 2: Nutritional attitudes and beliefs and perceived barriers to nutrition guidance practices (the majority resulting from factor analysis), used in the LISREL-path analysis of **intensity of nutrition education and information (A)** and of **noticing patients' overweight and guidance about treatment (B).**

Description	α[1)]	item[2)]	Analysis
Interest in the effect of nutrition on health	-	1	A, B
Perception of own ability to influence lifestyles and eating habits of patients with health problems (≡ self-efficacy factor)	.78	2	A, B
Perception of own ability to give dietary advice in the treatment and prevention of coronary heart disease (≡ self-efficacy factor)	.70	2	A, B
Perception of role of behaviour and heredity on health	.73	7	A, B
Task perception	.69	24	A, B
Attitude regarding treatment of overweight	.65	5	A, B
Attitude towards weight-health relationship	-	1	A, B
Attitude on the role of diet in CVD	-	1	A
Lack of nutrition training and education (perceived barrier)	.76	4	A
Lack of skills to treat overweight (perceived barrier)	.65	5	A, B
Lack of time to treat overweight (perceived barrier)	.74	2	A, B
Lack of patient motivation to reduce overweight (perceived barrier)	.67	2	B
Appreciation of Standard Cholesterol Protocol and its applicability	.74	2	A
Body Mass Index (BMI) of the PCP (weight:height^2)	-	2	A
Workload (function of number of patients in practice and number of patients seen per day)	.72	2	A
Opinion about effectivity of obtaining adequate nutrition education by congresses or educational courses	.78	4	A
Nutrition interest of partner of PCP	-	1	A
Type of practice	-	1	B

1) *Crohnbach's alpha, a measure of reliability of the factors*

Figure 2: LISREL-model of mechanism of action of determinants of intensity of nutrition education and information of PCPs to their patients



The predisposingfactors 'nutritrional interest' and 'self-efficacy chd' have a significantly higher total effect onthe dependent variable compared with the predisposing factors 'self-efficacy general' and 'role of behaviour on health', whereas they mutually do not differ significantly.

The predisposing factors 'self-efficacy general' and 'role of behaviour on health' have only positive indirect effects on intensity of nutrition education and information via driving forces (Figure 2). The predisposing factors 'nutritional interest' and 'self-efficacy chd' exert their positive indirect effects both through driving forces and barriers.
The direct and indirect effects of the intermediary variables on the dependent variable in Figure 2 are all positive, except for the negative role of two perceived barriers which are 'lack of nutrition training and education' and 'lack of time to treat overweight' (which are negative). There also appears to be a (negative) effect of a perceived barrier (lack of time to treat overweight) on a driving force (attitude regarding treatment of overweight). This effect confirms the hypothesis in our model of Figure 1.

Personal health habits of PCPs are sometimes considered as barriers to health promotion behaviour[4,7,8,23-25]. We did use the Body Mass Index of the PCP (as being an indication of personal health habits) in our LISREL-path analysis (see Table 2) to test whether it was a predisposing factor or intermediary factor in the model of Figure 2. It proved to be none of them (possibly because of its distribution: 75% of the PCPs had a normal BMI ($20 \leq BMI \leq 25$) and only 1% of the PCPs had a BMI > 30).

Dependent variable noticing patients' overweight and guidance of treatment

The 11 factors used in the LISREL-path analysis for analyzing the dependent variable 'noticing patients' overweight and guidance of treatment' are given in Table 2. Of these 11

factors, 5 factors do have a high Crohnbach's alpha and three factors do have a moderate Crohnbach's alpha. The other three factors were based on one question. The hypothesis that the dependent variable is determined by the predisposing factors, with or without intermediary factors could be confirmed because the LISREL-program provided also in this subject a model with an excellent fit[22] (Figure 3). The obtained LISREL-model of Figure 3 (page 116) does fit with the empirical data ($\chi^2_{DF=22}=20.74$, $P=.537$); the adjusted goodness of fit index (AGFI)=.984. The percentage of explained variance in 'noticing patients' overweight and guidance of treatment' by the LISREL-model is 23% (which is in agreement with the 25% delivered by multiple regression analysis[15]).

From this LISREL model (Figure 3) it becomes clear that all predisposing factors act in principle through intermediary factors on the dependent variable. Only predisposing factor 'role of behaviour on health' acts also directly on this dependent variable, the direct effect being the most important one.

The effects of the above-mentioned predisposing factors on the dependent variable are given in Table 3 (page 117). We do observe that predisposing factor 'role of behaviour on health' scores the highest effect followed by respectively the predisposing factors 'self-efficacy general' and 'nutritional interest'; and 'self-efficacy chd'. There is a strong tendency of positive indirect effects via driving forces on the dependent variable.

It is surprising that the variable 'lack of patient motivation to reduce overweight' does not play a role in the mechanism of action of the determinants. Another surprising finding is that the two perceived barriers 'lack of skills' and 'lack of time to treat overweight' do not have a direct effect on the dependent variable - as we postulated in our model (Figure 1). As in the other LISREL-model (Figure 2), also in this LISREL-model (Figure 3) there appear to be (negative) effects of perceived barriers on a driving force. The total (negative) effects of

Figure 3: LISREL-model of mechanism of action of determinants of noticing patients' overweight and guidance of treatment

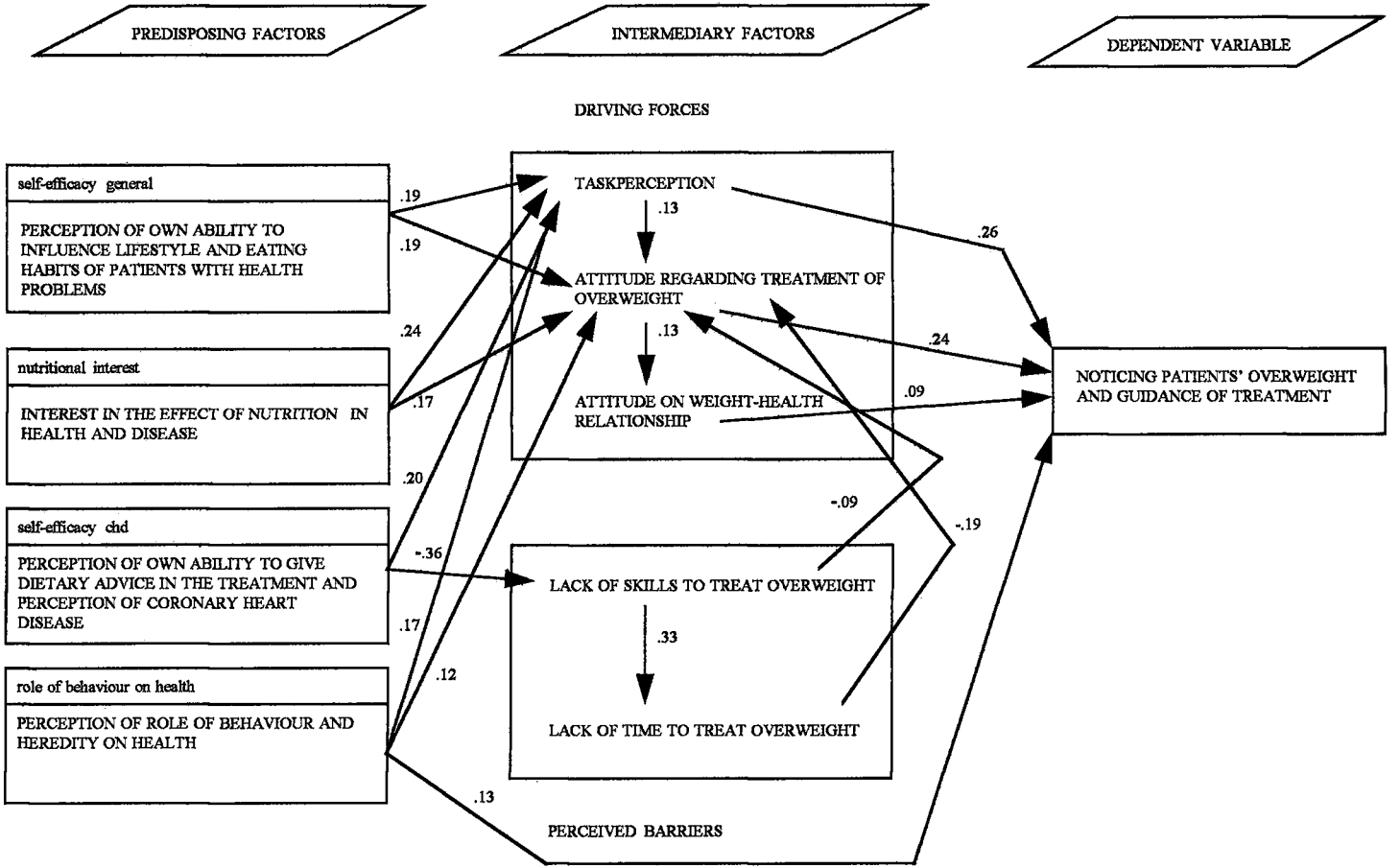


Table 3: Effects of the predisposing factors on the dependent variables **intensity of nutrition education and information** (see model Figure 2) and **noticing patients' overweight and guidance of treatment** (see model Figure 3).

	Self-efficacy general	Nutritional interest	Self-efficacy chd	Role of behaviour on health
Effect[1]) on variable intensity of nutrition education and information:				
Indirect effect	.051±.012	.094±.017	.130±.020	.039±.010
Direct effect	.100±.032	.147±.032	.141±.030	-
Total effect	.151±.034	.241±.036	.271±.036	.039±.010
Effect[1]) on variable noticing patients' overweight and guidance of treatment:				
Indirect effect	.103±.017	.115±.018	.072±.014	.080±.016
Direct effect	-	-	-	.133±.035
Total effect	.103±.017	.115±.018	.072±.014	.213±.038

[1]) *Values ± SE*

these perceived barriers on the dependent variable are, however, relatively small.

Integration of results.

Our hypothesis and model (Figure 1) was confirmed by the models (Figure 2 and 3) based upon our research data. The findings indicate clearly that PCPs' involvement in nutrition during general practice e.g. the level and intensity of nutrition education he/she is giving or the alertness to identify and treat overweight (which are the dependent variables) are the result of both a number of predisposing factors and of a number of so-called intermediary factors which either act as driving forces or as perceived barriers.

DISCUSSION AND CONCLUSIONS

This study confirms that PCPs' nutrition guidance practices are for a part directly determined by predisposing factors and indirectly via driving forces and barriers which play an intermediary role. The postulated hypothesis and model (Figure 1) developed on the basis of qualitative research and measured attitudes could be confirmed.

In both constructed LISREL-models (Figure 2 and 3) four predisposing factors were identified to play a major role:

- perception of own ability to influence lifestyle and eating habits of patients with health problems;
- interest in the effect of nutrition in health and disease;
- perception of own ability to give dietary advice in the treatment and prevention of coronary heart disease;
- perception of role of behaviour and heredity on health.

In both LISREL-models the driving forces 'task perception', 'attitude regarding treatment of overweight' and the perceived barriers 'lack of skills to treat overweight' and 'lack of time to treat overweight' play a definite role as intermediary variables. In one LISREL-model (Figure 2) 'attitude on the role of diet in CVD' is added as a driving force and 'lack of nutrition training and education' as a perceived barrier. In the other LISREL-model (Figure 3) the driving force 'attitude on weight-health relationship' is entered.

An important difference between the LISREL-models (Figure 2 and 3) is the way the perceived barriers are acting on the dependent variables. In the LISREL-model on determinants of 'intensity of nutrition education and information' the perceived barriers 'lack of time' and 'lack of nutrition training and education' do have a direct effect on the

dependent variable. Such a direct effect of perceived barriers, however, is not found in the LISREL-model on 'noticing patients' overweight and guidance of treatment'.

Although PCPs perceive 'lack of patient motivation to reduce overweight' as a barrier to 'noticing patients' overweight and guidance of treatment', in reality this perceived barrier does not play a role in the mechanism of action of determinants of this dependent variable (Figure 3). This result is in agreement with the findings of multiple regression analysis[15]. The danger of this perceived barrier is that it can become a self-fulfilling prophecy: trying to reduce overweight in patients of which PCPs think they lack motivation will - in their perception - not lead to a success, so PCPs might ask themselves what is the rationale of trying?

In this study we have used the LISREL-analysis methodology. Until now, this methodology has not been used in determining nutrition practices of primary care physicians. However, there are recent articles on dentist' practices[26] and on occupational stress among family physicians[27], using this methodology. What advantages has the LISREL-method compared to the more traditional multiple regression analysis (MRA)? For our study we can state that LISREL did provide us with a more indepth understanding of the mechanism which influences the dependent variables 'intensity of nutrition education and information of PCPs' and 'noticing patients' overweight and guidance of treatment'.

A comparison of our LISREL-model (Figure 2) with findings using multiple regression analysis (MRA)[15] leads for the dependent variable 'intensity of nutrition education and information of PCPs' to the following conclusions.

There is good agreement on the percentage of explained variance between the two methods: 33% (Figure 2) versus using MRA 32%[15]. The same predisposing factors will be obtained in both analysis[15]. The perceived barrier 'lack of skills to treat overweight' - which has very

strong effects on the other two perceived barriers in the model - will not be determined with MRA[15]. Of the three driving forces 'task perception', 'attitude on the role of diet in CVD' and 'attitude regarding treatment of overweight', the last variable will not be detected with RMA[15]. The question now is how relevant it is that the LISREL-model has identified both an additional driving force and an additional perceived barrier compared to the MRA. It is remarkable that both the driving force and the perceived barrier have to do with treatment of overweight, respectively on attitude and on lack of skills. The analysis of linear structural relationships (LISREL) can lead to a better understanding of the structure among determinants of nutrition guidance practices (with incorporation of 'hidden factors') whereas MRA delivers beta-weights regarding the strength of the effect, but not an understanding of the mechanism of action i.e. direct and indirect influences. In this mechanism of action (Figure 2) both the 'hidden variable' 'lack of skills to treat overweight' and the driving force 'attitude regarding treatment of overweight' play a crucial role.

A comparison of our LISREL model (Figure 3) with findings using multiple regression analysis (MRA)[15] leads for the dependent variable 'noticing patients' overweight and guidance of treatment' to the following conclusions.

There is good agreement on the percentage of explained variance between the two methods: 23% (Figure 3) versus 25% MRA[15]. Of the four predisposing factors in the model, only the most important one will be identified as a determinant by MRA[15]. The three intermediary factors 'task perception', 'attitude regarding treatment of overweight' and 'attitude on weight health relationship' in our model will be delivered as determinants by MRA[15]. However, the two perceived barriers in the model were not delivered as determinants by MRA[15], probably because they exert their effect via attitude regarding treatment of overweight. The variable 'type of practice' which is a determinant in MRA[15] has not a place in the LISREL-model in Figure 3.

In this case the advantages of the LISREL-model compared with MRA are very clear. The LISREL-model leads to a clear understandig of the structure among determinants, whereas MRA will not deliver three of the four predisposing factors and also not the two perceived barriers.

Green and Kreuter's central message[16] is first to try to understand the factors that influence behaviour (the educational and organisational diagnosis) before coming to the administrative and policy diagnosis and later on to implementation. The additional use of LISREL is of paramount importance for this understandig, as shown.

In general, policies to improve nutrition guidance practices of PCPs might in future benefit from a LISREL-model analysis of determinants of these practices to become more effective. If multiple regression analysis is used to ascertain the determinants of these practices, this might lead to a missing of important predisposing factors and of 'hidden' intermediary factors and therefore to an incomplete understanding of the mechanism of action.

ACKNOWLEDGEMENTS

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Chapter 6

Information sources and strategies of nutrition guidance used by primary-care physicians

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ABSTRACT

We have studied the nutrition information seeking behaviour of primary-care physicians (PCPs), and further the implementation of different strategies of patient nutrition guidance by PCPs. This was done by means of a mail questionnaire in a nationwide random sample of 1000 PCPs in the Netherlands. The net response rate was 64%. The two most important nutrition information sources were the dietician (72% of the respondents) and literature (34% of the respondents). Eighty-five percent of PCPs reported that they were actively involved in nutrition information seeking. In patient nutrition education, PCPs implemented especially personal information to patients, referral to the dietician and publications in the surgery. As methods of obtaining nutrition information themselves, PCPs preferred scientific journals, postgraduate nutrition education, congresses and study days, and publications.

Determinants for the nutrition information seeking behaviour of PCPs as well as their implementation of different strategies of patient nutrition education were identified and discussed. A check on the familiary of PCPs with Body Mass Index led to a positive answer, which is encouraging because treatment of overweight and obesity starts with a valid assessment by the PCP.

The findings in this study lead to a prudent positive conclusion about the PCP and nutrition information in practice. From this study and others it can be concluded that there are growing opportunities, challenges and tools for PCPs to become more actively involved in nutrition guidance of patients.

INTRODUCTION

In 14-28% of patients' consultations by primary-care physicians (PCPs) diet comes up for discussion[1-3]. In the search for determinants of nutrition guidance practices of PCPs many perceived barriers as well as some driving forces have been identified[4-15]. PCPs perceive a lack of nutritional knowledge and skills in their patient nutrition guidance, both in general and in special fields, e.g. prevention and treatment of overweight and of coronary heart disease[3,7,11,14,17]. Orleans et al[4] found that PCPs underutilized potentially effective methods of patient nutrition guidance and behavioural change and overutilized less effective methods. Levine et al[16] reported that those PCPs who relied on serious nutrition information sources (literature, nutritionist or dietician) tended to have better nutrition guidance practices. Worsley and Worsley[17] found that most PCPs relied on a variety of nutrition information sources including several unorthodox sources. PCPs generally agree that nutrition is important in clinical practice[11,16] and that they as PCPs should provide nutrition information to the patient[11,18], but they do not provide nutrition information to a great degree[11,16].
The key questions however are: if PCPs are seeking nutrition information, what sources they refer to and which strategies they implement in patient nutrition information?
In order to understand and to improve patient nutrition guidance practices by primary care physicians, we report here on the nutrition information seeking behaviour of PCPs, their perceived effectivity and applicability of strategies of providing nutrition education to the patients, and their implementation of these methods.

METHODS

A random sample of 1000 primary care physicians was drawn from the 2798 PCPs in the Netherlands who had been practising for the past 5 to 15 years[11]. In October 1992, the 1000

PCPs were sent a specially developed mail questionnaire (the Wageningen GPs Nutritional Practices Questionnaire), based on methodology described by Dillman[19]. After the initial personal letter and questionnaire, a personal follow-up letter was sent every two weeks (three times), if necessary. After eleven weeks, the first telephone reminders were started (maximum three reminders), as described earlier[11].

The Wageningen questionnaire was based on qualitative research (focus group discussions and in-depth interviews) and consisted of issues such as task perception as primary care physician, nutritional attitudes and beliefs, dealing with nutrition education in practice (nutrition guidance practices). Special attention was given to:

- the nutrition information seeking behaviour of PCPs
- attitudes concerning strategies of providing nutrition information to the patients
- implementation of nutrition information in their own practice
- attitudes concerning strategies of nutrition education aimed at PCPs, as well as
- a typical example of a knowledge variable which is important in treatment and prevention of overweight: the variable 'knowledge of BMI-classifications'.

Nutrition information seeking behaviour of PCPs was measured by the question which of fourteen defined possibilities (organisations, dietician, literature, none, other) was contacted in the last two years to obtain nutrition information (answer: yes/no). Effectivity' and 'applicability' of different strategies of providing nutrition education to the patients were both measured on a three point scale (respectively not effective/reasonably effective/very effective and not good/reasonably good/ very good applicable). Implementation in own practice was measured on a three point scale (never/no longer/yes, at present). Both 'effectivity' and 'applicability' of different strategies of nutrition education aimed at PCPs were measured on a three point scale (respectively not effective/reasonably effective/very effective and not good/reasonably good/very good applicable). Applicability of these methods to own practice was measured on a three point scale: not very/reasonably/very applicable.

Characteristics of the 633 PCPs who responded to the questionnaire are summarized in an earlier publication[11]. Briefly, the net response rate was 64%. The 633 respondents were well representative of the population of PCPs who had been in practice for between 5 and 15 years according to sex, year of starting practice and sex by type of practice distribution. The mean item non-response in our survey was very low: 1.6%[19]. The mean time needed to complete the questionnaire was 41 minutes.

Seventy percent of PCPs in our study claimed to be interested in the effect of nutrition on health (and 25% said they were 'neutral' in this respect).

Statistics

The principal components analysis with varimax rotation (factor analysis) was used for scale construction[20]. Skewed distributions were normalized by square root transformation. Factors were calculated as weighted sums of items, according to scale width. Crohnbach's α was used as a measurement of reliability of scales derived from factor analysis. The analyses of determinants of nutrition information seeking behaviour of PCPs (and also of the other two variables: 'implementation of nutrition education by PCPs' and 'knowledge of BMI-classifications') are based on general characteristics of the respondents and their practices (9 variables), personal characteristics of the respondents (14 variables), available information about nutritional attitudes and beliefs (16 variables), and on perceived barriers (6 variables), as described earlier[14]. Determinants of nutrition information seeking behaviour of PCPs (and other variables) were analysed by multiple regression analyses[20] using the Bonferroni correction in the stepwise procedure, as modified by Holms[21]. The adjusted R square indicates the percentage of explained variance. Because of correlations between the independent variables, forward multiple regression analyses as well as backward multiple regression analyses were performed in all cases to check the stability of the solution. The result was only accepted when the two solutions were identical and when no sign of

multicollinearity was found when studying partial correlation coefficients with the dependent variable. Associations were studied using Pearsons correlations test.

For the identification of the mechanism of action of determinants of the dependent variable linear structural relationships analysis (LISREL path analysis) was used (program version 7.16, Jöreskog and Sörbom,[22]). When the conditions of a) low residuals, b) all t-values of effects >2 and c) an acceptable Q-plot of all standardised residuals are fulfilled[22], the LISREL-solution was accepted. X^2_{DF}, P, adjusted goodness of fit index (AGFI) are presented to indicate the quality of the model.

RESULTS

In the following paragraphs an in-depth analysis will be presented on nutrition information seeking behaviour of PCPs, and on the implementation of nutrition education by PCPs. Further the topic of treatment of overweight will be discussed via the variable 'Knowledge of BMI-classifications'.

Nutrition information seeking behaviour of PCPs

The two most important nutrition information sources are the dietician (contacted in the last two years by 72% of the respondents) and the literature (34% of the respondents searched for nutrition information in the literature in the last two years). The Food and Nutrition Education Bureau and the Heart Foundation are in third and fourth position with respectively 33% and 22%. Fifteen percent of PCPs report that no nutrition information seeking took place in the last two years, whereas 32% consulted two different sources. Independent of the number of sources, consulted in the last two years (0-5), the pattern is that the dietician is on top. The number of consulted sources during two years is 1.8 ± 1.2 (mean $\pm$ SD).

The next research question is: which factors are the determinants of the nutrition information

seeking behaviour of PCPs, be it nutrition information seeking behaviour by contacting different public health organisations, by contacting the dietician or by searching for nutrition information in the literature. This study is done via multiple regression analysis. The first topic is on the number of different organizations contacted by PCPs for nutrition information during the last two years (Table 1A, page 134)). It is found that four variables together explain 13% of the variance. Three variables exert a positive influence and therefore can be considered as driving forces, whereas the variable 'unfavourable conditions to treat coronary heart disease' (most important constituents: lack of time and lack of patient motivation) exerts a negative influence and therefore can be considered as a barrier.

In the analysis of contacting the dietician for nutrition information in the last two years by PCPs, it is found that four variables together explain 9% of the variance (Table 1B, page 134). All four exert a positive influence and can therefore be considered as driving forces.

The third topic is on PCPs' literature search for nutrition information in the last two years and three variables are found which together explain 8% of the variance (Table 1C, page 134). All three exert a positive influence and can therefore be considered as driving forces.

The conclusion can be made that the nutrition information seeking behaviour of PCPs is determined by quite a large number of driving forces. However multiple regression analysis shows that all these driving forces only explain a small part of the variance.

When we compare the nutrition information seeking behaviour of PCPs who contacted the dietician for nutrition information in the last two years with those who did not contact the dietician, than the first group of PCPs does more than two times more searching the literature for nutrition information than the latter group. Contacting the dietician for nutrition information and searching the literature for nutrition information correlate with each other; the correlation coefficient $r=.22$ ($P<.01$).

How do PCPs perceive the nutrition information which they themselves receive?

Table 1: Determinants of nutrition information seeking behaviour of PCPs

A

Number of different organizations contacted during the last two years for nutrition information	ß[1]	P[2]
Awareness of PCP of the content of dietary guidelines	.21	xxx
Attitude of PCP on the role of diet in cardiovascular disease	.15	xxx
PCPs' perception of nutrition importance in future	.12	xxx
Unfavourable conditions to treat coronary heart disease	-.11	xx
	Multiple R Explained variance	=.36 = 13%

B

Contact with dietician during the last two years for nutrition information	ß[1]	P[2]
Literature searched for nutrition information during the last two years by PCP	.21	xxx
Awareness of PCP of the content of dietary guidelines	.13	xxx
PCPs' perception of nutrition importance in future	.12	xx
Workload (function of number of patients in practice and number of patients seen per day)	.11	xx
	Multiple R Explained variance	=.31 = 9%

C

Literature search for nutrition information during the last two years	ß[1]	P[2]
Contact with dietician during the last two years for nutrition information by PCP	.23	xxx
Planned time per consultation by PCP	.15	xxx
PCPs' opinion about effectivity of obtaining adequate nutrition education through scientific journals, popular scientific journals, nutrition magazines, publications	.11	xx
	Multiple R Explained variance	=.29 = 8%

1) The coefficient ß of an independent variable shows the direction and the relative contribution of that independent variable to the explanation.
2) P is the P-value for the test of regression coefficient equals zero.
   xxx : $P<0.001$
   xx : $P<0.01$

It seems logical to expect that PCPs should have positive attitudes towards nutrition and to different strategies of delivering nutrition information. We surveyed the perceived effectivity of nine different strategies of delivering nutrition information to PCPs as well as the perceived applicability for the general practice (Table 2, page 136).

The nine methods differ strongly in perceived effectivity (measured as percentage of very/reasonably effective) and in perceived applicability in their practice (measured as percentage of very/reasonably applicable). Not surprisingly, post graduate education on nutrition, scientific journals and congresses and study days are on top of perceived effectivity (more than 80% effective). They are followed by publications and personal discussions (about two-thirds effective). The remaining strategies have a perceived effectivity of 41-52%. On the other hand, when it comes to the perceived applicability of these methods in their own practice, scientific journals are on top (77% applicable), than postgraduate education on nutrition (70%) and publications (67%), and then followed by 'congresses and study days' and personal discussions (Table 2). All strategies are at least applicable to one-third of PCPs, except videopresentations (28%) and information by telephone in response to queries (27%).

Implementation of nutrition education by PCPs

Almost all respondents do give personally nutrition information to patients and do ask patients to make an appointment with the dietician to provide them with nutrition education. The PCPs judge these activities to be both very effective (very or reasonably effective) and applicable (very good/reasonably applicable) (Table 3, page 136). Eighty percent of the respondents have publications in the consulting-room; they judge this to be both effective and applicable. Telephone guidance in response to queries is implemented by 57% of PCPs, whereas journals for patients and information by the paramedical assistant are implemented by a third of the respondents. Further video presentations and educational meetings for patients are judged as effective. The application of these strategies however is (very) low.

Table 2 Attitudes of PCPs about themselves receiving nutrition information (N=633).

Strategies of delivering nutrition information to PCPs	% Very/reasonably effective	% Very/reasonably applicable
Postgraduate education on nutrition	91	70
Scientific journals	84	77
Congresses and study days	81	59
Publications	74	67
Personal discussions	63	45
Nutrition Magazine	52	36
Video presentations	49	28
Popular 'scientific' journals	45	37
Information by telephone in response to queries	41	27

Table 3 Attitude of PCPs about themselves implementing nutrition education (N=633)

Strategies of providing nutrition education to the patients	% Very/reasonably effective	% Very/ reasonably applicable	% Implementation in own practice
Personal information of patients	98	94	92
Ask patients to make an appointment with the dietician	96	95	93
Publications in the surgery	83	90	80
Telephone guidance in response to queries	52	65	57
Journals for patients	59	70	34
Information by paramedical assistant	68	51	32
Video presentations	59	11	3
Educational meetings for patients	75	26	8

The percentage of PCPs who do not longer implement a certain strategy of nutrition education never exceeds 10%.

The information of Table 3 leads via factor-analysis to the factor 'perceived effectivity and applicability of different strategies of nutrition education to the patients' (Crohnbach's α=.70, 16 items). Furthermore, PCPs' implementation of nutrition education was defined (on the basis of the information of Table 3) as the factor 'magnitude of implementation of different strategies of providing nutrition education in own practice', being the mean of the number of implemented strategies of nutrition education.

Now the question is: which factors are the determinants of PCPs' implementation of nutrition education? The analysis of determinants of PCPs' magnitude of implementation of nutrition education via multiple regression analysis learns that four factors explain 15% of the variance (Table 4, page 138). All four factors exert a positive influence (and therefore can be seen as driving forces). The most important factor is 'perceived effectivity and applicability of different strategies of providing nutrition education'. The other three explaining factors are about of equal importance (Table 4).

PCPs' knowledge of BMI classifications

The variable 'knowledge of BMI classifications' is based on the right or wrong classification of a) overweight and b) obesity, in BMI terms as defined by the National Health Council[24] (two, one or zero correct answers possible; distribution respectively 59%, 11% and 30%). This variable can be considered as a knowledge-variable. Multiple regression analysis leads to the following explanation of the variable 'knowledge of BMI classifications'. Two determinants were identified, 'awareness of the content of Dietary Guidelines' and age of PCP, which explain only 5% of the variance (Table 5 column A, page 138). If we also include two nutrition guidance practice variables in the explanation (Table 5 column B, page 138), three factors together explain 19% of the variance. In comparison with Table 5A, the

Table 4 Determinants of PCPs' implementation of providing nutrition education.

FORWARD SOLUTION ≡ BACKWARD SOLUTION	β^1	P^2
Opinion about effectivity and applicability of different strategies of providing nutrition education	.35	xxx
Awareness of information and educational possibilities of nutrition education organizations	.12	xx
Number of organizations contacted during the last two years for nutrition information	.11	xx
Opinion about effectivity of obtaining adequate nutrition education by congresses or educational courses	.10	xx
	Multiple R=.39 Explained variance =15%	

1) The coefficient β of an independent variable shows the direction and the relative contribution of that independent variable to the explanation.
2) P is the P-value for the test of regression coefficient equals zero.
   xxx : P<0.001
   xx : P<0.01

Table 5: Determinants of PCPs' knowledge of BMI-classifications:
A: multiple regression analysis as described in the text
B: also two nutrition guidance practice variables are used[1]

FORWARD SOLUTION ≡ BACKWARD SOLUTION	A ß[2]	A P[3]	B ß	B P
Awareness of the content of dietary guidelines	.20	xxx	.12	xx
Whether or not using the Body Mass Index as the most valid method to assess overweight			.31	xxx
Self-reported familiarity with BMI			.18	xxx
Age of PCP	−.11	xx		
	Multiple R = .23 explained variance = 5%		Multiple R = .44 explained variance = 19%	

1) Whether or not using the Body Mass Index as the most valid method to assess overweight and self-reported familiarity with BMI.
2) The coefficient ß of an independent variable shows the direction and the relative contribution of that independent variable to the explanation.
3) P is the P-value for the test of regression coefficient equals zero.
   xxx : P < 0.001
   xx : P < 0.01

new explaining variables are 'whether or not using the Body Mass Index as the most valid method in assessment of overweight' and 'self-reported familiarity with BMI'. They both exert a positive influence and are as such more important than the variable 'awareness of the content of Dietary Guidelines'.

Twenty-seven PCPs (5%) reported not to be familiar with BMI, whereas 602 PCPs (95%) report to be familiar with BMI. As a check on familiarity with BMI, the respondents were asked to report on the maximum accepted weight for a man of 30-50 years, height 1.79 metres and for a woman of 30-50 years, height 1.73 metres. (The reported values in kgs were expressed in Body Mass Index, in both cases the border is defined as BMI=25 (Dutch Health Council[24]. The reported value for the man was significantly above BMI=25 (the mean value $\pm$SD was 25.3 $\pm$1.7), whereas the reported value for the woman was significantly below BMI=25 (the mean value $\pm$SD was 24.4 $\pm$1.8). Although these reported values are highly significantly different from BMI=25, the mean differences are very small: respectively 1.1 kg for the man and 1.7 kg for the women. Eleven percent of PCPs gave a value for the man, resulting in a BMI$\geq$27, whereas only 1% gave a value resulting in a BMI$\geq$30. Five percent of PCPs gave a value for the woman, resulting in a BMI$\geq$27, whereas only 1% gave a value, resulting in a BMI$\geq$30. Male and female PCPs do not differ in their maximum accepted weight for the man or the women.

PCPs who are not familiar with BMI reported a significantly lower maximum accepted weight for the woman (70.4$\pm$6.2 kg versus 73.1$\pm$5.4 kg, P=.012), but not for the man.

In an earlier publication[25] we defined a general model of the factors determining nutrition guidance practices based upon a LISREL path analysis. The question now is: does a general model also fit for the variable 'knowledge of BMI-classifications'? To solve this question, we used altogether 17 factors in the LISREL-path analysis (Table 6, page 140). Of these 17 factors, the four predisposing factors are equal to those in our earlier publication[25]; as possible intermediary variables we used 7 driving forces and 6 perceived barriers[11,14,25].

Table 6: Nutritional attitudes and beliefs and perceived barriers to nutrition guidance practices (the majority resulting from factor analysis), used in the LISREL-path analysis of **knowledge of BMI-classifications**.

Description	α[1)]	item[2)]
PREDISPOSING FACTORS		
Interest in the effect of nutrition on health	-	1
Perception of own ability to influence lifestyles and eating habits of patients with health problems (≡ self-efficacy factor)	.78	2
Perception of own ability to give dietary advice in the treatment and prevention of coronary heart disease (≡ self-efficacy factor)	.70	2
Perception of role of behaviour and heredity on health	.73	7
DRIVING FORCES		
Awareness of the content of dietary guidelines	.75	3
Self-reported familiarity with BMI	-	1
Whether or not using the Body Mass Index as the most valid method to assess overweight	-	1
Task perception	.69	24
Attitude regarding treatment of overweight	.65	5
Attitude towards weight-health relationship	-	1
Attitude on the role of diet in CVD	-	1
PERCEIVED BARRIERS		
Lack of nutrition training and education	.76	4
Lack of skills to treat overweight	.65	5
Lack of time to treat overweight	.74	2
Lack of patient motivation to reduce overweight	.67	2
Lack of skills to treatment of coronary heart disease	.76	5
Unfavourable conditions to treat coronary heart disease	.62	4

1) *Crohnbach's alpha, a measure of reliability of the factors*
2) *number of items constituting a factor*

The hypothesis that the dependent variable is determined by the predisposing factors, with or without intermediary factors, could be confirmed because the LISREL-program provided a model with an excellent fit (Figure 1, page 142). The obtained model does fit with the empirical data ($X^2_{DF=16}=16.7$, P=.41; the adjusted goodness of fit index (AGFI)=.983). The percentage of explained variance in 'knowledge of BMI-classifications' by the LISREL-model is 21% (which is in good agreement with the 19% obtained by multiple regression analysis (Table 5). From the LISREL model of Figure 1 it also becomes clear that only one of the predisposing factors acts both directly and indirectly on the dependent variable; the other three predisposing factors act only indirectly on the dependent variable. The effects of the four predisposing factors on the dependent variable are only minor, compared with the effects of the intermediary variables (which are driving forces) (Figure 1). The key factor in Figure 1 is 'whether or not using the Body Mass Index as the most valid method to assess overweight', which acts directly on the dependent variable and exerts the largest total effect (Table 7, page 143). 'Selfreported familiarity with BMI' and 'awareness of the content of dietary guidelines' have both a direct and an indirect effect. Task perception has only an indirect effect. It is striking that there is not any perceived barrier part of the solution of Figure 1!

Figure 1. LISREL model of mechanism of action of determinants of knowledge of BMI-classifications

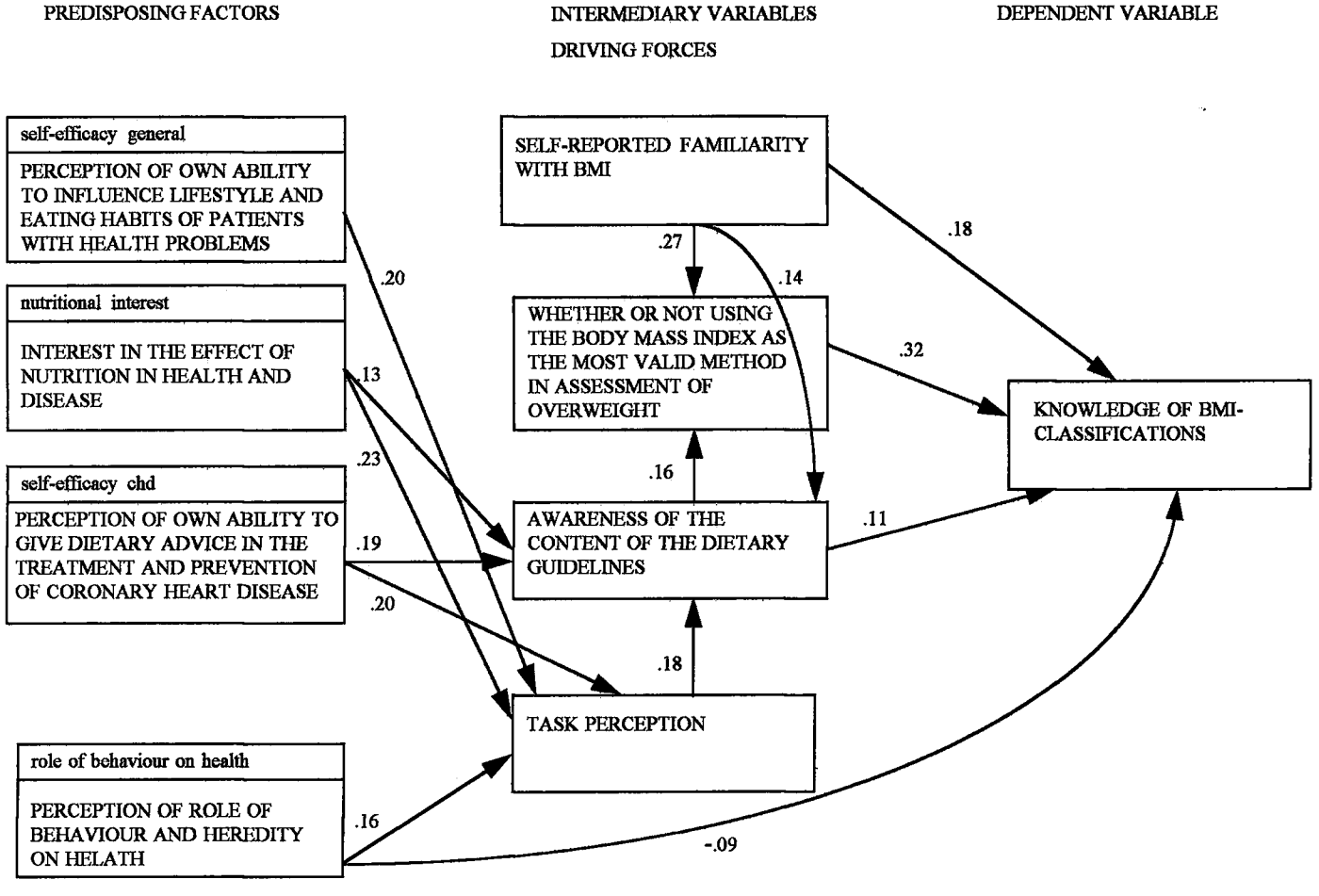

Table 7: Effects of the predisposing factors and intermediairy variables on the dependent variable **knowledge of BMI classification** (see model Figure 1).

Effect[1] on variable knowledge BMI classification	Total effect	Direct effect	Indirect effect
PREDISPOSING FACTORS			
Self-efficacy general	.006±.002		.006±.002
Nutritional interest	.027±.009		.027±.009
Self-efficacy chd	.037±.0011		.037±.0011
Role of behaviour on health	-.085±.036	-.080±.036	.005±.002
DRIVING FORCES			
Self-reported familiarity with BMI	.288±.038	.180±.034	.108±.018
Whether or not using the BMI as the most valid method to assess overweight	.322±.038	.322±.038	------
Awareness of the content of dietary guidelines	.163±.038	.112±.035	.051±.014
Taskperception	.029±.009		.029±.009

[1] *Values ± SE*

DISCUSSION

In order to understand patient nutrition guidance practices by primary care physicians, we surveyed the nutrition information seeking behaviour of PCPs, their perceived effectivity and applicability of strategies of patient nutrition guidance, and the implementation of these strategies in their own practice. The results of this study can be generalized to the population of PCPs who have been in practice for between 5 and 15 years[11].

The nutrition information seeking behaviour of PCPs can be described as encouraging and positive. Eighty-five percent of the PCPs reported that they contacted in the last two years the dietician or an educational organisation for nutrition information or searched the literature to obtain this information. The range of sources was 0-5, the mean ($\pm$SD) was 1.8 ($\pm$1.2). Independent of the number of sources, the dietician was on top. According to Green & Kreuter[23], nutrition information seeking behaviour of PCPs can be seen as the positive outcome of a decision making process, whereby the information seeker wants to invest costs (time, effort) in the expectation to gain nutrition information. Positive nutrition information seeking behaviour of PCPs can thus be considered as an essential first step towards implementation of nutrition into patient guidance.

Seventy-two percent of the PCPs contacted in this time period the dietician for nutrition information. The picture in the literature about PCPs' referral to the dietician is inconsistent. Orleans et al.[4] reported that family physicians underutilized possibilities for referral to other health-care workers, including the dietician. Kottke et al[10] reported that family physicians in private practice in the USA seldom referred to the dietician. However, when Canadian physicians referred patients for nutrition counselling, 80% of the referrals were to hospital-based dieticians[26]. In addition, Kelly and Joffres[27] reported that 62% of the referrals for nutrition information by PCPs were to dieticians. Glanz et al[28] reported that nutrition

counselling was also frequently provided by the office dietician (46% of cases) or a dietician outside the practice (37% of cases). Laswell et al[29] reported that 63% of responding graduates of a family medicine residency referred patients with nutritional problems to registered dieticians in private practice. Primary care physicians view registered dieticians as credible sources of nutrition information[30,31]. We can conclude that dieticians do play a very important role in nutrition counselling of patients referred to them by PCPs. In the US Preventive Services Task Force publication on nutritional counselling[32], it is stated that PCPs can overcome many existing barriers in nutritional counselling by referring patients requiring help with dietary changes to qualified nutritionists, registered dieticians, health educators, nurses or other providers with greater nutrition expertise.

Thirty-four percent of the PCPs searched in the last two years the literature for nutrition information. Other studies indicate that scientific literature was reported to be an important source of nutrition information for PCPs[16,17]. After the dietician and the literature, the Food and Nutrition Education Bureau and the Heart Foundation in the Netherlands are in third and in fourth position with respectively 33% and 21%. Governmental nutrition education organisations and Heart Foundations in general are frequently reported as important nutrition information sources for PCPs[17].

Fifteen percent of PCPs reported that they did not seek any nutrition information in the last two years; this figure is lower than the 22% found by Kelly & Joffres[27].

Our results on the nutrition information seeking behaviour of PCPs are very positive. However, we have to be very careful with conclusions because our measurements of the nutrition information seeking behaviour have their limitations. Our measurement makes only a difference in contacting or not contacting an organisation or individual in the given time period; not in the frequency of contacts nor the content of contacts. The same is true for the measurement of literature search for nutrition information. Therefore, the variance in answers we found is smaller than when we would also have asked for the frequency of

contacts or literature searches in the given time-period. Further we can not exclude the possibility that in the latter case the explained variance by the determinants of the nutrition information seeking behaviour of PCPs would have been higher than the percentages we have found now (13%, 9% and 8% respectively), because we do not know anything of the attenuation correction. Now the conclusion can be made that the nutrition information seeking behaviour of PCPs is determined by a large number of driving forces, although these driving forces only explain a small part of the variance.

However there is one consistent observation in the information seeking behaviour of PCPs. When PCPs contacted in the given time period the dietician for nutrition information, than their chance to search for nutrition information in the literature was more than doubled, compared with the group of PCPs who did not contact the dietician. Contacting the dietician for nutrition information and searching the literature for nutrition information seem to go hand in hand: the correlation coefficient $r=.22$.

In this study we also compared nine strategies of delivering nutrition information to PCPs. It was found that the perceived effectivity and perceived applicability differed strongly: post graduate nutrition education, reading scientific journals, attending congresses and study days, and general publications are on top of the effectivity list. Personal discussions are in the middle and the other strategies (Table 2) are at the bottom. In general, the same holds true for perceived applicability in own practice, where reading scientific journals is on top of the list.

In this study we compared eight strategies of patient nutrition information by PCPs, which we will now discuss. Personal information to patients and asking the patient to make an appointment with the dietician are considered by PCPs to be highly effective and highly applicable. More than 90% of PCPs implement these strategies of nutrition guidance. From

the point of view of communication science, interpersonal communication is potentially a very powerful instrument for information and for behavioural change[23]. Publications in the surgery do also have a good score in perceived effectivity and perceived applicability; 80% of PCPs do have publications in the surgery.

More than half of the PCPs consider telephone guidance in response to queries as effective and applicable; 57% implement this in their own practice. Journals for patients and talks with the paramedical assistant have a lower implementation by PCPs (about one-third) than we would expect on the basis of perceived effectivity and perceived applicability of these methods. Videopresentations and educational meetings for patients have a good score on perceived effectivity, but a relatively very low score on perceived applicability, which makes that only a few percent of PCPs implement these strategies. Under the new regulations in the UK, primary care physicians get reimbursement for educational meetings for groups of patients. These educational meetings have to be under the responsibility of the PCP but can be given by non-physicians. This system might offer interesting perspective for nutrition education meetings. Glanz et al[28] reported that non-physicians can play an active role in the distribution of educational materials, in answering nutrition questions and in determining ideal body weight.

It is surprising that PCPs show no disappointment in any of the strategies discussed above. This observation seems to be in contrast with the generally low involvement of PCPs in nutrition information to patients. Unfortunately, there is probably only one study which determined the relative efficacy of different strategies of giving dietary advice in general practice. Neil et al (34) reported that lipid lowering dietary advice given by a dietician, a practice nurse or a diet leaflet alone resulted in equal small effect on lipid levels.

Almost all respondents do give personally nutrition information to patients and do ask patients to make an appointment with the dietician to provide them with nutrition education.

By far the most important determinant of PCPs' implementation of providing nutrition education to the patients (Table 4) is 'perceived effectivity and applicability of different strategies of providing nutrition education'. (The other three explaining factors are of equal importance). Educational organizations have to reinforce continuously the effectivity of different strategies, preferably on the basis of research and have to show positive personal results in courses 'learning by doing'.

Which factors are determinants of PCPs' knowledge of BMI-classifications? The most important determinant (Table 5B) is 'the use of the Body Mass Index as the most valid method to assess overweight', followed by 'self-reported familiarity with BMI'. They both exert a positive influence. LISREL-path analysis showed that 'the use of the Body Mass Index as the most valid method to assess overweight' explains (partly) PCPs' knowledge of BMI-classifications and not vice versa. This may indicate that learning-by-doing with BMI in educational courses for PCPs is more important for their clinical practice than only learning by head.

Inherent to mail questionnaires, all data are based on self-report, including 'self-reported familiarity with BMI'. We checked this familiarity with two cases, a 'defined' man and a 'defined' woman, and asked for the maximum accepted weight. On the basis of the results, it is fair to conclude that PCPs in general gave maximum accepted weights for the man and the women which are respectively only 1.1 kg too high and only 1.7 kg too low (gold standard BMI=25). The percentage of PCPs who gave values, which were above BMI=27 were for the defined men only 11% and for the defined women only 5%; for both cases 1% of PCPs gave a value, which was above BMI>30. This is a very encouraging finding, because treatment of overweight and obesity starts with a valid assessment by the PCP.

Conclusion. The self-reported findings in this study lead to a rather positive conclusion about the PCP and nutrition information in practice. PCPs report a positive nutrition information seeking behaviour. They also report to ask nutrition information from the dietician, which is in agreement with Glanz et al[28]. They further report that they implement different strategies of nutrition education. Their reports on the maximum accepted weights for both the defined man and women were - in BMI-terms - also good.

However these findings seem to be not in line with the observation of the rather low involvement of PCPs in nutrition activities and practices as well as the barriers identified to be involved in such practices due to low nutrition knowledge, short of time available and doubts about dietary compliance of patients.

From of this study and others[11,12,14,16,25,27,28,29,33,35] we may nevertheless conclude that there are growing opportunities, challenges and tools for PCPs to become more actively involved in nutrition guidance of patients.

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Chapter 7

General discussion and recommendations

INTRODUCTION

This thesis describes studies on the nutritional attitudes and knowledge of primary-care physicians (PCPs) as well as their nutrition guidance practices. Further the determinants of nutrition guidance practices as well as their working mechanism were analyzed and reported. In addition one study is presented, which describes the consumer expectations of such nutrition guidance.

This chapter starts with a brief overview of the preparation-phase of the study (quality assurance-phase). Then the main findings of the consumer study are summarized. Next the main findings of the studies with PCPs are given. Then these findings are discussed in an integrated way in the light of the present situation of medical education of PCPs and of PCPs in practice. Finally further research needs in this area are defined and discussed.

In the preparation-phase it was decided to carry out the research with PCPs, in practice for between 5 and 15 years. The rationale of this choice can be judged as arbitrary. We however consider a rather homogeneous group methodologically as the best option. Further arguments are given in Chapter 1.

We decided also to approach the PCPs by a mail questionnaire. This mail questionnaire was specifically developed for this research project using literature and qualitative research (focus group discussions and in-depth interviews). A working group was established to improve relevance, clarity and face validity of the questionnaire as described in Chapter 1. In this way the Wageningen GPs Nutritional Practices Questionnaire (see Annex 1) was developed. The database on PCPs, collected by the Netherlands Institute of Primary Health Care was used for random selection of PCPs and also for the non-participation research. A pretest and a pilotstudy were carried out before the quantitative mail survey was started. A random

sample of 1000 PCPs was drawn out of the 2798 PCPs in the database who had been practising for between 5 and 15 years. The implementation of the mail survey was based on the methodology of Dillman[1], as described in Chapter 2. The fieldwork was carried out between medio October 1992 and medio February 1993.

A specifically developed telephone questionnaire was used for the consumer study. It was developed by a working group, consisting of one health education and extension expert, two nutritionists (all faculty members) and two senior market research officers.

The telephone survey among a random sample of Dutch consumers of 18-80 years, living in a household, in which four or more times a week is being cooked, was carried out in 1991 and is described in Chapter 1.

MAIN FINDINGS CONSUMER STUDY.

In a random sample of Dutch consumers, we surveyed their referral to eleven nutrition information sources including the PCP, their perceived expertise of these sources, their interest in nutrition information and their nutritional attitudes and beliefs (Chapter 2). On the basis of factor-analysis, these eleven sources of nutrition information delivered two factors: the factor 'non-commercial sources'(including the PCP, the dietician and the Food and Nutrition Education Bureau (FNEB), α =.70) and the factor 'commercial sources' (α = .78).

Respondents referred more to 'non-commercial sources' than to 'commercial sources' (54% versus 21%, P<.0001). The perceived expertise of 'non-commercial sources' was higher compared with 'commercial sources'. (3.9 $\pm$ 0.6 versus 2.7 $\pm$ 0.6 (mean $\pm$ SD, P<.01). The individual Spearman correlation coefficient between referral score and perceived expertise was rho = .35 $\pm$ .36 (mean $\pm$SD). For most sources, respondents' referral to that source was dependent on a higher interest in information about a healthy diet and on respondents' perceived expertise of that source. In the factor 'non-commercial sources' there

are three leading sources: PCP, dietician and FNEB. Careful analysis revealed that because of the high referral score, the high perceived expertise and the reach of nearly all segments of the population, PCPs are in a unique position over the dietician and FNEB. From the point of view of health promotion planning[2], the conditions of patients/consumers to receive nutrition information by PCPs
can be considered as positive and encouraging.

MAIN FINDINGS STUDIES WITH PRIMARY-CARE PHYSICIANS.

The study with primary-care physicians had the following important characteristics:

1. a questionnaire which was based on interactive field-research (focus group discussions and indepth interviews)
2. a net response rate which was relatively high compared to the literature and which was achieved due to carefully planned supportive communication (Dillman, 1978)[1]
3. the construction of scales of perceived barriers, and of factors of nutritional attitudes and beliefs, using factor-analyses
4. the fact that there was a very low item non-response (1.6%)
5. and finally because the results can be generalised to Dutch PCPs who have been in practice between 5 and 15 years (Chapter 3).

In the following paragraphs we will report on the main findings with regard to nutritional attitudes and beliefs of PCPs, the identified perceived barriers to nutrition guidance, determinants of PCPs' nutrition guidance (illustrated with two examples) as well as the mechanism of action of determinants (illustrated with the same two examples). Then the main findings of the information sources and strategies of nutrition education used by PCPs and PCPs' practices regarding patients' overweight are reported.

Nutritional attitudes and beliefs of PCPs.

The nutritional attitudes and beliefs of PCPs are described in Chapter 3. Seventy percent of PCPs claimed to be interested in the contribution of diet to health and 25% said they were 'neutral' in this respect. PCPs perceived smoking to be the greatest health hazard, followed by dietary pattern and genome, and then by reduced physical activity, stress, poor hygiene and alcohol abuse. The majority of PCPs confirmed that general health information (95%) and nutrition information (76%) is a part of their task, also at individual prevention level. However, they perceived their tasks in health and nutrition information to be more at secondary or tertiary level (90% positive answers) rather than primary prevention (60% positive answers).

About half the PCPs agreed that they themselves should follow exemplary lifestyles and dietary patterns. The PCPs differed in their judgement of the ability of their patients to change their lifestyle and dietary habits: 40% believed that a specific recommendation by them to change the lifestyle and dietary habits will be followed up by their patients; about 25% considered that this advice will be ignored and about 30% were undecided.

In general, the nutritional attitudes and beliefs of PCPs found in this study can be considered as rather positive and encouraging.

In addition, it is promising to note that Dutch GPs smoked less than their socio-economic class peers and that they had a very low percentage of high Body Mass Indexes (>30) compared to the Dutch population as a whole.

Identification of perceived barriers

An important topic is the identification of PCPs' perceived barriers to nutrition guidance of their patients (Chapter 3). It was found that PCPs did perceive strong barriers of being involved in nutrition issues during practice: 65% expressed lack of nutrition training as a

barrier, 47% lack of time to address nutrition issues and 43% had the perception that patients lack motivation to change lifestyle and/or dietary patterns.

A striking result was that 49% of PCPs had no barrier to treatment of coronary heart disease (CHD) and 19% indicated only one barrier. This may reflect that the 'cholesterol consensus' is well known by PCPs in the Netherlands (Grol & Heerdink, 1992)[2] .This observation is similar to the situation in the United States, as reported by Schucker et al (1987, 1991)[3,4].

Determinants of PCPs' nutrition guidance

Which are the determinants of nutrition guidance practices of primary-care physicians?

A very surprising finding is that not only perceived barriers are important determinants of nutrition guidance practices, but that driving forces also play a significant role. The perceived barriers, such as lack of nutrition training and lack of time are often observed in comparable studies[5 - 11]. That driving forces can be identified as an important determinant is so far we know never explicitly found and discussed. Driving forces reflect a positive nutrition task perception of the PCP based upon an active interest in the effect of nutrition on health and disease, a positive nutritional attitude and a basic level of nutrition knowledge.

We have shown, that the PCP activities in the field of nutrition education and information of patients are amongst others determined by three driving forces which are:

- perception of own ability to give dietary advice in treatment and prevention of cardiovascular disease;
- attitude on the role of diet in cardiovascular disease;
- appreciation of a standard cholesterol protocol.

Therefore it is no surprise that the cholesterol standard protocol is very well known by PCPs in the Netherlands[2] and that the majority of PCPs are of the opinion that this protocol is applicable in their practice (85%).

Comparable findings on driving forces are shown for the PCPs' guidance of treatment of overweight.

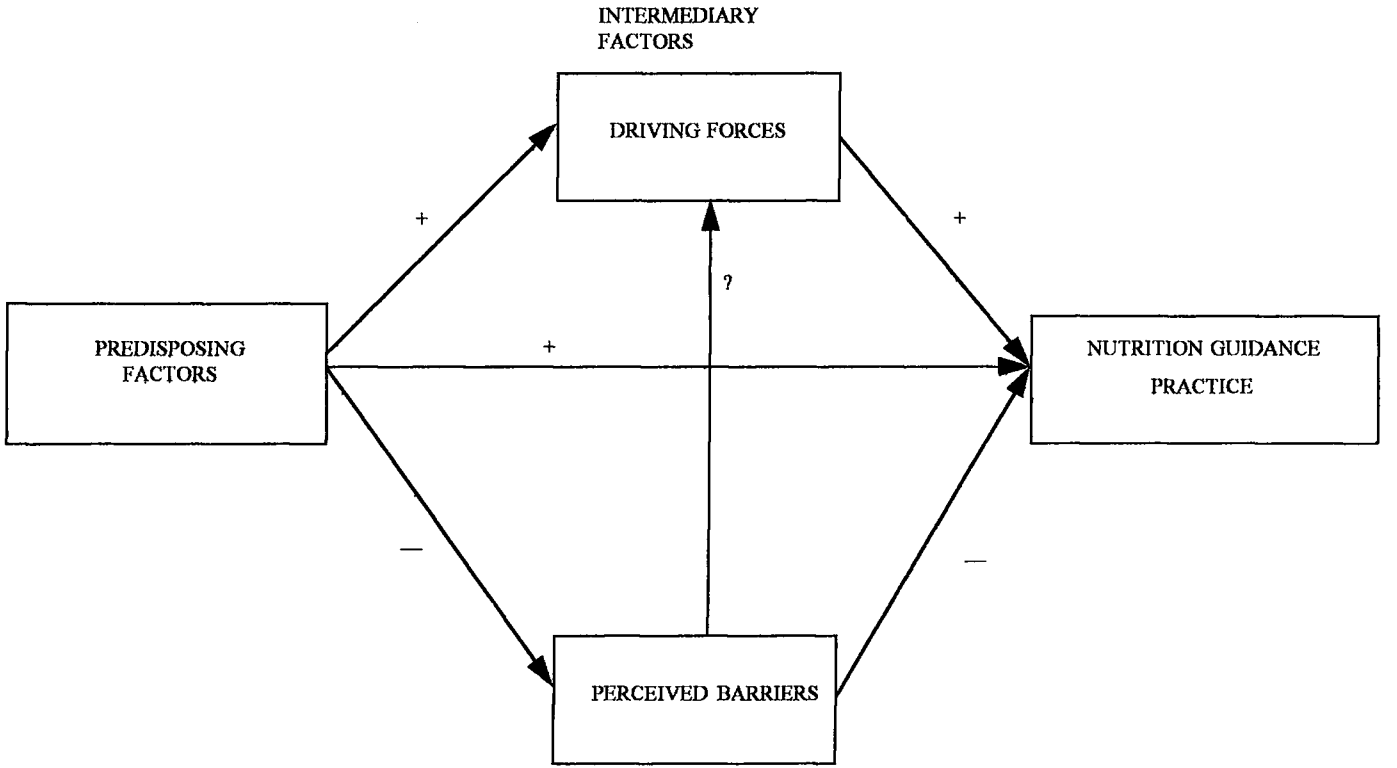
Mechanism of action of determinants

When determinants of nutrition guidance practices of PCPs are identified[14], then the key question still is: what is the mechanism of action? This knowledge is necessary in order to understand how PCPs do practice nutrition guidance. The mechanism of such action was studied by means of linear structural relationship analysis (LISREL) using a postulated model (Chapter 5). This model (Figure 1, page 162) states that nutrition guidance practices of PCPs are directly and significantly based on a small number of predisposing factors, whereby driving forces and perceived barriers can act as significant intermediary variables. The postulated hypothesis and model on the mechanism of action could be confirmed.
One LISREL-model was constructed on PCPs' degree of nutrition education and information and another LISREL-model was constructed on the PCPs' approach to an overweight patient. In both models the following four predisposing factors could be identified:

(i) the PCPs' perception of own ability to influence lifestyle and eating habits of patients;
(ii) the same as in (i) but then in relation to coronary heart disease;
(iii) the interest the PCP has in the effect of nutrition on health and;
(iv) the perception of the PCP on the influence of a number of health behaviours and heredity on health.

As significant intermediary variables in these LISREL-models we observed both perceived barriers (lack of nutrition training and education, lack of time to treat overweight, and lack of skills to treat overweight) and driving forces (task perception, attitude regarding treatment of overweight, attitude on weight- health relationship, and attitude on the role of diet in cardiovascular disease). There is however a striking difference in the two LISREL-models described above. In the LISREL-model on 'degree of nutrition education and information'

Figure 1: Postulated general model of mechanism of action of determinants of nutrition guidance practices of PCPs (+ = positive effect, - = negative effect)



the perceived barriers do have a direct effect on the dependent variable. This is not found in the LISREL-model on the PCPs' approach to an overweight patient.

Information sources and strategies of nutrition education used by PCPs

Nearly all PCPs (91%) said that they were familiar with the information on the cholesterol standard guideline, formulated by their own association: the Netherlands College of General Practitioners (Binsbergen et al. 1992)[12]. On the other hand, the rather broad and quite general Dutch dietary guidelines (Dutch Nutrition Council, 1986[13]; Netherlands Bureau for Food and Nutrition Education, 1991[14]) were only familiar to a much smaller group (23-32%) (Chapter 3). This does not necessarily mean that Dutch PCPs do not use those guidelines. When PCPs do not have sufficient nutrition knowledge to be able to give nutrition advice to their patients, then consultation media could be part of the solution.

The vast majority of PCPs were aware of, and used nutrition information (Chapter 6). The two most important nutrition information sources were the dietician and the literature: 72% of PCPs regularly contacted dieticians or referred patients to them and 34% sometimes searched the literature on nutrition issues. The Food and Nutrition Education Bureau and the Heart Foundation in the Netherlands are in third and in fourth position with respectively 33% and 21%.

Eighty-five percent of PCPs reported that they were actively involved in nutrition information seeking. Consequently, the nutrition information seeking behaviour of PCPs can be described as encouraging and positive. In Chapter 6, it is concluded that the nutrition information seeking behaviour of PCPs is determined by quite a large number of driving forces. However multiple regression analysis shows that all these driving forces only explain a small part of the variance.

In the next paragraphs the main findings regarding strategies of nutrition education used by

PCPs are given. The behaviour of PCPs on providing nutrition information to patients will depend on several factors. In the first place why and when does a PCP come to the conclusion to give nutrition information to a patient, then which nutrition information will be given and finally the PCPs' perception about applicability and effectivity of the choosen nutrition information. In this study we evaluated eight possibilities of providing nutrition information by PCPs. Personal information to patients and asking the patient to make an appointment with the dietician were considered by PCPs to be highly effective and highly applicable. More than 90% of PCPs implemented these choices of nutrition guidance. Publications in the surgery did also have a good score in perceived effectivity and perceived applicability; 80% of PCPs do have publications in the surgery. More than half of the PCPs implemented telephone guidance in response to queries in their own practice. Journals for patients and talks with the paramedical assistant have a lower implementation by PCPs (about one-third). Video presentations and educational meetings for patients are only implemented by a few percent of PCPs.

The percentage of PCPs who no longer implemented any kind of strategy of nutrition information never exceeds 10%; this could be seen as an indication that PCPs are not disappointed in any of the possibilities they have.

The most important question however is to know why and when a PCP decides to give nutrition information to a patient. There is no doubt that the PCPs' decision on this question is mainly determined by the assessment of effectivity and applicability of the different nutrition information sources. As a consequence, it may be concluded that effective and applicable nutrition information sources for patients should be continuously reinforced in PCPs.

The question now is, where does a PCP get his/her information on effectivity and applicability of nutrition information to patients. We have inventarised nine possibilities (Chapter 6). According to PCPs postgraduate nutrition education, scientific journals,

congresses and workshops and 'general' publications are considered as the most effective activities to get good information on nutrition information to their patients.

Overweight.

For the assessment of overweight, 30% of the PCPs used the body mass index (BMI); 32% used BMI and another assessment (clinical appearance or patient's assessment) and 16% used only clinical appearance. Half the PCPs differentiated between overweight and obesity (Chapter 3).

An interesting question is to what extent PCPs do have technical knowledge of the classification of patients in overweight and obesity on the basis of the Body Mass Index. We addressed this question with the variable 'knowledge of BMI-classifications' (Chapter 6). Fifty-nine percent of the PCPs correctly classified overweight and obesity in BMI-terms, 11% correctly classified one of the two and 30% classified both overweight and obesity in BMI-terms in a wrong way (Standard Dutch Health Council: overweight =: $25 < BMI \leq 30$ and obesity: $BMI > 30$).

The most important determinant of PCPs' knowledge of BMI-classifications is, whether or not the PCP uses the Body Mass Index as the most valid method to assess overweight, followed by 'self-reported familiarity with BMI'. They both exert a positive influence. LISREL-path analysis showed that whether or not the PCP uses the Body Mass Index as the most valid method to assess overweight explains (partly) PCPs' knowledge of BMI-classifications and not vice versa. This may indicate that learning-by-doing with BMI in educational courses for PCPs is more important for their clinical practice than only learning by heart (Chapter 6).

Inherent to mail questionnaires, all data are based on self-report, including 'self-reported familiarity with BMI'. We checked this familiarity with two cases, a 'defined' man and a

'defined' woman, and asked for the maximum accepted weight using BMI = 25 as a maximum. On the basis of the results, we could conclude that PCPs in general gave rather acceptable weights for the man and the woman. However, the man was scored 1.1 kg too high and the woman 1.7 kg too low at a BMI of 25. The percentage of PCPs who however gave weight values, leading to a BMI above 27 were for the defined man 11% and for the defined woman 5%. This is a very encouraging finding, because treatment of overweight and obesity starts with a valid assessment by the PCP (Chapter 6).

FOCUS ON FOUR SPECIFIC TOPICS

The findings in this research need further discussion on four topics. In the first place we will review whether certain perceived barriers by PCPs at giving nutrition guidance to their patients could be reduced as well as whether driving forces could be strengthened. In the second place we will elaborate on the use of the LISREL-analysis in this research and we will discuss advantages of LISREL in comparison with multiple regression analysis. We also will stipulate on the importance of the identification of predisposing factors. In the third place we need to discuss further the surprising observation that the PCPs perceived barrier that patients lack motivation to reduce overweight is not revealed as such in the LISREL-model. What does this indicate? As a final point we discuss the impact that PCPs can have on behavioural changes of dietary patterns of patients.

Reducing the barriers and strengthening the driving focus

The study on nutrition guidance practices of PCPs clearly shows that this practice is hampered by the fact that PCPs report a lack of nutritional knowledge and skills. This lack of nutrition training is obviously a strong barrier. It is justified to make a firm recommendation that a short introductory nutrition training should be provided during each regular medical training program. We can and want not argue more about this and only

suggest that medical schools should provide evidence that nutrition related to health and diseases is part of the curricula and fill a relative reasonable number of lectures, practice classes and/or skills and laboratory training. We further like to recommend that a follow-up in this nutrition training should be given to specific groups of medical practitioners who are regularly dealing with nutrition topics. We have thereby in mind PCPs, pediatricians, gastroenterologists and cardiologists. We also see possibilities for follow-up training activities e.g. for PCPs through interactive distant-learning programmes.

There is much experience with the so-called role-models when the objective is to learn skills[15 - 20]. Lazarus et al[15] reported on a successful education program in a family-practice residency setting, provided by a physician nutrition specialist (PNS). A Committee of the American Society of Clinical Nutrition (ASCN) recommended in 1995 that each major medical center should have at least one physician nutrition specialist[16]. The Group on Nutrition Education of the Society of Teachers of Family Medicine[17] recommended in 1995 a teaching team for residents, consisting of a faculty physician with an interest in nutrition and a clinical nutritionist. This team acts also as a practice team, providing care and providing a role model for the competent use of nutritional therapy.

The second most important perceived barrier of PCPs to address nutrition issues was lack of time as expressed by 47% of PCPs. 'Lack of time' of PCPs is a variable with rather unclear features; it stresses the conflict of everyday practice between the urgent curative care and preventive activities.

Lack of time has often been reported as a perceived barrier to health promotion and health education (Boulton & Williams, 1984[21]; Wells et al, 1985[9]; Orleans et al, 1985[5]; Henry et al, 1987[10]; Kelly & Joffres, 1990[7]; Langseth & Gemson, 1991[8]; Lazarus, Weinsier & Boker, 1993[15]). Recently, Stange et al (1994)[22] asked 480 US family physicians -on the basis of a casus description- which preventive activities they might practice in case there is 5 minutes

left from the consult-time. The casus regarded a 53-year old women, who smoked and was overweight and who had not seen the doctor for three years. The response rate was 56%. Most of the respondents would discuss cessation of smoking, measure the bloodpressure, measure height and weight and make a follow-up appointment. This research illustrates the importance of time-management to solve the barrier lack of time.

The third and last barrier is the perception of PCPs that patients are not motivated to change lifestyle and/or dietary practices.

The finding that 43% of the PCPs perceived that patients lack motivation to change lifestyle and/or dietary pattern (in the case of treatment of overweight even 64%) is not surprising. Kottke et al (1984)[11] found 'lack of patient motivation' the most important barrier to giving nutrition education; in our study it was the third important barrier. Our finding that 'lack of patient motivation' was the most important barrier to treatment of overweight and the most important barrier (item-level) to treatment of CHD confirms the results of Henry et al (1987)[10] for overweight and those of Kottke et al (1984)[11] for treatment of CHD. This barrier indicates that PCPs must have learned skills to motivate patients to change their behaviour. On the other hand, it seems fair not to overlook the possibility that patients may have both unrealistic high expectations of the PCP and of themselves with regard to diet compliance.

The U.S. Preventive Services Task Force publication on nutritional counselling[23] concludes that in cases of barriers PCPs could and should refer patients to e.g. nutritionists and dieticians. Glanz et al[24] reported that such nutrition counselling is already frequently provided by the office dietician(46% of cases) or a dietician outside the practice (37% of cases). Primary care physicians rightly view registered dieticians as credible sources of nutrition information[25,26]. This however does not mean that PCPs should be exempted from nutrition duties to their patients.

PCPs in the UK have been given recently specific tasks to organize health educational group meetings for patients for which they also receive reimbursement. Such meetings might be given by non-physicians; however, PCPs have full responsibility for the content. This might offer interesting possibilities for nutrition education meetings.

In addition to strategies to overcome barriers, driving forces should be strengthened to get PCPs more involved in nutrition guidance of their patients. As a consequence, PCPs' taskperception, PCPs' attitude regarding treatment of overweight, PCPs' attitude on weight-health relationship and PCPs' attitude on the role of diet in cardiovascular disease (Figures 2 and 3, Chapter 5) should get special attention.

Advantages of LISREL and importance of predisposing factors

We used the LISREL-analysis methodology in our studies. So far we know, this methodology has hardly been applied in other studies determining nutrition practices of primary care physicians. LISREL was applied in recent articles on dentists' practices[27] and on occupational stress among family physicians[28]. Does the LISREL- method has advantages compared to the multiple regression analysis (MRA)? We have compared findings using the LISREL-models (Figures 2 and 3, Chapter 5) with findings using multiple regression analysis (MRA) (Chapter 4). We could conclude that the LISREL-model lead to a more indepht understanding of the structure among determinants, whereas MRA did not reveal three of the four predisposing factors and two perceived barriers. Thus LISREL provided us with a better understanding of the structure among determinants of nutrition guidance practices (with incorporation of 'hidden factors') compared to MRA. MRA delivers beta-weights regarding the strength of the effect, but not an understanding of the mechanism of action i.c. direct and indirect influences. If only MRA is used to ascertain determinants of PCPs nutrition guidance practices, than this might lead to missing important predisposing factors and 'hidden' intermediary factors and therefore to an incomplete understanding of the

mechanism of action.

Green and Kreuter[29] clearly indicate that factors which influence behaviour should be known before coming to any administrative and policy diagnosis and later on to implementation. We conclude that policies to improve nutrition guidance of PCPs will benefit from a LISREL - model analysis of determinants of these practices.

We have indicated above that LISREL identifies more predisposing factors than MRA. We will discuss why this is an important finding. LISREL shows e.g. clearly that a successful practice depend on the interest of PCPs in the effect of nutrition on health. Such interest is after the factor awareness the second essential step in the process of diffusion of innovations.[30] Without interest, further steps in this process are impossible. Other predisposing factors identified are the factor influence of behaviour on health, and the self-efficacy variables 'perception of own ability to influence lifestyle and eating habits of patients' and 'perception of own ability to give dietary advice in the treatment and preventing of coronary heart disease'. We did observe that these predisposing factors play an at least equal important role on the ultimate effect compared with the several intermediary factors which where identified as driving forces and perceived barriers. The consequence of this observation therefore is that nutrition education programmes for PCPs should address these predisposing factors, these driving forces and these perceived barriers at the same time to reach the best possible outcome.

We may now come to the following conclusion. We have found that PCPs do have both awareness and interest to give nutrition guidance during practice. However they still lack nutrition knowledge and skills. If this education is provided to PCPs we may than expect increased dietary activities during practice which could be of large benefit for the patients. The notion of self-efficacy is a component of Bandura's social cognitive theory, which attempts to explain the determinants of behaviour and its modification (Strecher et al 1986[31],

Bandura, 1977[32]). A number of strategies outlined in Bandura's social cognitive theory can be of help to increase PCP's self-efficacy: verbal persuasion, vicarious experience or modelling and personal experience.

In case of verbal persuasion it is necessary to present data showing that PCPs can effectively help patients to change their eating pattern and lifestyle. In the case of vicarious experience or modelling, PCPs are exposed to peers who feel confident and successful in helping patients to change their eating pattern and lifestyle. In the case of personal experience, a structured dietary treatment program on the basis of sound behaviour change principles can help to guide PCPs' counselling, which increases the likelihood of successful dietary change among patients.

Extent of patients' motivation to reduce overweight

Both in the LISREL and the MRA analysis we did not observe the perceived barrier of PCPs on the lack of motivation in patients to reduce overweight (Figure 3, Chapter 5). This may indicate that trying to reduce overweight in patients of which PCPs think they lack motivation will - in their perception - not lead to a success, so PCPs might ask themselves what is the rationale of trying? Thus nutrition education for PCPs should include information about the extent of patients' motivation to reduce overweight, as well as indicators of this motivation.

The impact of PCPs on behavioural change of patients

Finally we will discuss the impact that PCPs can have on behavioural aspects in changing dietary patterns of patients. The classic example that physicians can have an impact on their patients' ability to change their health behaviour is given by the effect of general practitioners advice against smoking, as reported by Russell et al in 1979[33].

The question is can health education activities in general, and specifically also by the PCP,

alter health behaviour respectively of people and patients. There is at present substantial evidence that health education can alter health behaviour. The evidence is shown in a report by the Council of Scientific Affairs of the American Medical Association (1990) on 'Education for Health' with subtitle 'A role for physicians and the efficacy of health education efforts'[34]. It is also reported that physicians perceive that they could improve their effectiveness of bringing patients to behavioural change several fold with appropriate continuing educational skill development[34].

A major review on the effectiveness of nutrition education and implications for nutrition education policy, programs and research was recently published in the Journal of Nutrition Education[35]. With regard to health professionals, the review states that continuing education in its current form is 'more likely to improve teaching and presentation skills than interpersonal skills and ability to promote dietary adherence'. The review further concludes that effective and successful programs are behaviourally focused, based upon appropriate theory and prior research, and include motivational messages in educational strategies[35].

A recent Australian reviewpaper ('Recommendations on Nutritional counselling activities in the primary health care system'[36]) concludes that nutrition counselling at the primary-care level may be effective, but only under certain conditions. Initiation of more shared-care doctor-dietician approaches to dietary management, together with consistent and regular reinforcement by the PCP of the dieticians' individualized advice would seem to be one effective model. In addition, this review concluded that there is evidence to suggest that doctors can also be effective dietary behaviour change agents themselves, provided they have the appropriate training, counselling skills and appropriate educational resources for their patients.

RESEARCH NEEDS

The subject of nutrition guidance of patients by PCPs is still in a rather early phase of development. Research on this topic is limited and often lack analyses which could improve our understanding of the process between PCP and patient. Most research has been done on diet and cardiovascular diseases and research on other diet-related diseases is hardly available[36].

We hardly know why some PCPs do have nutritional skills and dedication to nutritional counselling and why most PCPs are not involved. Further we have hardly any insight into the nature of the nutritional advises which PCPs give to their patients. Do PCPs consider this as a process (as Truswell[37] does) or as a one moment task? What is the role of the existing patient-doctor relationship in case of nutritional guidance?[39]

A general problem is the lack of information on the relative efficacy of different strategies of giving dietary advice in general practice. It is known that the efficacy of a lipid lowering dietary advice is equal when given by a dietician, a practice nurse, or a diet leaflet[38]. We do not know what efficacy would have been achieved by a PCP.

The study presented in this thesis obviously has its limitations. Therefore we must be careful in giving firm conclusions. There is no doubt that in many aspects presented in this thesis more indepth research is needed.

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Summary

SUMMARY

In this thesis several nutrition related studies are described among primary-care physicians (PCPs). The aim of these studies was to analyze nutrition guidance practices of PCPs, their nutritional attitudes and knowledge and their interest in the role of nutrition in health and disease. A second objective was to identify the determinants of nutrition guidance practices as well as their working mechanism. In addition one study is described, on consumers expectations of such nutrition guidance.

The determinants of nutrition guidance practices of PCPs are poorly understood. So far studies searching for determinants of nutrition guidance practices of PCPs have been limited to identifying perceived barriers of PCPs or by addressing specific areas, for example cardiovascular risk reduction. The key question however is what kind of predisposing, enabling and reinforcing factors are playing a role when PCPs offer nutrition guidance to their patients. In order to improve patient nutrition guidance practices by PCP, information is needed about factors which determine these nutrition guidance practices.

Based on the literature and on focus group discussions and in-depth interviews a questionnaire was developed for use in a mail survey. It was pretested and a pilotstudy was carried out. This questionnaire was sent to a nationwide random sample of 1000 PCPs in the Netherlands, in practice for between 5 and 15 years. The net response rate was 64% (633/990).

A brief overview of the few studies so far carried out in PCPs and their involvement in nutrition practices is given in Chapter 1. Further the postulated working model of the action

of determinants of PCPs is presented, a rationale of the studies is given and the design of the studies is described.

The study among consumers is reported in Chapter 2. We investigated in a random sample of Dutch consumers their referral to eleven nutrition information sources including the PCP, their perceived expertise of sources, their interest in nutrition information and their nutritional attitudes and beliefs. PCPs appeared to be in a unique position over the dietician and Food and Nutrition Education Bureau (his best competitors), because of the high referral score, the high perceived expertise and the reach of nearly all segments of the population.

In Chapter 3 the perceived barriers of PCPs towards nutrition guidance and the low involvement of PCPs in nutrition guidance are described. It is found that PCPs do perceive strong barriers of being involved in nutrition issues during their practice. The most important barriers expressed were: a lack of nutrition training, lack of time to address nutrition issues and the perception that patients lack motivation to change lifestyle and/or dietary patterns. PCPs perceived smoking to be the greatest health hazard followed by dietary pattern and genome. Seventy percent of the PCPs expressed interest in the role of nutrition on health and disease.

Twenty-eight percent of PCPs gave daily nutrition information to about 10% of their patients and 48% to about 5% of their patients.

In Chapter 4 the driving forces and barriers of nutrition guidance practices of PCPs are described. Driving forces in PCPs are: an active interest in the effect of nutrition in health and disease, a basic level of nutritional knowledge and positive attitudes towards nutrition guidance practices. Barriers are lack of nutrition training and lack of time to treat overweight. These two barriers were strong negative determinants of one of the three

nutrition guidance practices studied. Driving forces were strong positive determinants in all three nutrition guidance practices studied. In future therefore, it may become more important to stress these driving forces.

An in-depth analysis of the mechanism of action of determinants of PCPs nutrition guidance practices is described in Chapter 5. A postulated model on the working-mechanism of determinants of nutrition guidance practices of PCPs could be confirmed, using LISREL-analysis methodology. (LISREL stands for 'linear structural relations'). The model stated that PCPs' nutrition guidance practices are directly and significantly based on a small number of predisposing factors; driving forces and perceived barriers may act as significant intermediary variables. The predisposing factors, driving forces and perceived barriers were identified. Comparing the results of LISREL-analysis with the results of multiple regression analysis (Chapter 4), it was concluded that if solely multiple regression analysis is used to ascertain determinants, this might lead to a missing of important predisposing factors and of 'hidden' intermediary factors and therefore to an incomplete understanding of the mechanism of action. Policies to improve nutrition guidance practices of PCPs might in future benefit from a LISREL-analysis of determinants of these practices to become more effective.

The nutrition information sources and strategies of nutrition guidance used by PCPs are described in Chapter 6. The four most important nutrition information sources of PCPs were the dietician (72% of the respondents), scientific literature (34% of the respondents), the Food and Nutrition Education Bureau (33%) and the Heart Foundation (21%). Eighty-five percent of PCPs reported that they were actively involved in nutrition information seeking. In patient nutrition education, PCPs implemented especially personal information to patients, referral to the dietician and publications in the surgery. As methods of obtaining information themselves, PCPs preferred scientific journals, postgraduate nutrition education, congresses and study days, and general publications.

A check on the familiarity of PCPs with Body Mass Index led to a positive answer, which is encouraging because treatment of overweight and obesity starts with a valid assessment by the PCP.

An in-depth discussion of the results obtained in this thesis is given in Chapter 7. In this Chapter also recommendations are given, as well as future research needs. Fortunately, the last three years several articles on PCPs involvement in nutrition are published. This reflects the increasing recognition by the scientific community of the importance of the primary-care physician in nutrition information of patients and public.

SAMENVATTING

In dit proefschrift worden verschillende onderzoeken onder huisartsen beschreven. Het doel van deze studies was het analyseren van het voedingsvoorlichtingsgedrag van huisartsen, hun voedingsattitudes en -kennis en hun interesse in de rol die voeding speelt in gezondheid en ziekte. Een tweede doel was het identificeren van determinanten van voedingsvoorlichtingsgedrag, alsmede het werkingsmechanisme van deze determinanten.

Er bestaat weinig inzicht in determinanten van voedingsvoorlichtingsgedrag van huisartsen. Tot nu toe hebben studies met het doel determinanten van voedingsvoorlichtingsgedrag van huisartsen vast te stellen zich beperkt tot het identificeren van door huisartsen gepercipieerde barrières of tot speciale gebieden, bijvoorbeeld reductie van cardiovasculair risico. De hamvraag is echter welke predisponerende, in-staat-stellende en versterkende factoren een rol spelen wanneer huisartsen hun patiënten voorlichten op voedingsgebied. Informatie is nodig over factoren die dit voedingsvoorlichtingsgedrag bepalen teneinde voedingsvoorlichtingsgedrag van huisartsen gericht op patiënten te verbeteren.

Gebaseerd op literatuuronderzoek, groepsgesprekken en diepte-interviews werd een vragenlijst ten behoeve van een schriftelijk onderzoek ontwikkeld. Deze vragenlijst werd gepretest en er werd een pilotstudie uitgevoerd. De vragenlijst werd verzonden naar een nationale random steekproef van 1000 huisartsen in Nederland, die tussen de 5 en 15 jaar in praktijk waren. De netto respons was 64% (633/990).

Een beknopt overzicht van reeds bekende onderzoeken onder huisartsen en hun geïnvolveerdheid in voedingsvoorlichting wordt gegeven in hoofdstuk 1. In dit hoofdstuk wordt ook het gepostuleerde werkingsmechanisme van de determinanten hiervan

gepresenteerd, wordt een rationale gegeven van de in het proefschrift beschreven onderzoeken en wordt het design van deze onderzoeken beschreven.

Het onderzoek onder consumenten wordt beschreven in hoofdstuk 2. In een random steekproef van Nederlandse consumenten werd onderzocht bij welke van elf voedingsinformatiebronnen (inclusief de huisarts) zij hun voedingsinformatie verkregen, hun perceptie van de deskundigheid van deze bronnen, hun interesse in voedingsinformatie en hun attitudes en beliefs op het terrein van de voeding. De huisarts, de diëtist en het Voorlichtingsbureau voor de Voeding blijken de drie belangrijkste bronnen van voedingsinformatie voor de consument te zijn. Huisartsen blijken een unieke positie in te nemen ten opzichte van de diëtist en het Voorlichtingsbureau voor de Voeding, vanwege de hoge graad van raadpleging, de hoge gepercipieerde deskundigheid en het bereiken van bijna alle segmenten van de populatie.

In hoofdstuk 3 worden de door huisartsen gepercipieerd barrières ten opzichte van voedingsvoorlichtingsgedrag en de lage geïnvolveerdheid van huisartsen in voedings-voorlichting beschreven. Huisartsen blijken sterke gepercipieerde barrières te bezitten ten opzichte van voedingsvoorlichtingsgedrag in hun praktijk. De belangrijkste door huisartsen gepercipieerde barrières zijn: gebrek aan voedingsopleiding en -training, gebrek aan tijd om voedingszaken te behandelen en de perceptie dat patiënten te weinig motivatie hebben om hun leefstijl en/of voedingspatroon te veranderen. Huisartsen percipiëren roken als het grootste gezondheidsrisico, gevolgd door voedingspatroon en erfelijkheid. Zeventig percent van de huisartsen is geïnteresseerd in de rol van voeding in gezondheid en ziekte. Achtentwintig procent van de huisartsen geeft dagelijks voedingsinformatie aan ongeveer 10% van hun patiënten en 48% aan ongeveer 5% van hun patiënten.

In hoofdstuk 4 worden de determinanten van voedingsvoorlichtingsgedrag van huisartsen beschreven. Determinanten met een positief effect (drijvende krachten) zijn: een actieve interesse in het effect van voeding in gezondheid en ziekte, een basaal niveau van voedingskennis en positieve attitudes en beliefs ten opzichte van voedingsvoorlichtingsgedragingen. Barrières zijn een gebrek aan voedingsopleiding en -training en een gebrek aan tijd om overgewicht te behandelen. Deze twee barrières waren sterke negatieve determinanten van één van de drie onderzochte voedingsvoorlichtingsgedragingen. Drijvende krachten waren sterke positieve determinanten in alle drie onderzochte voedingsvoorlichtingsgedragingen. Daarom zou het in de toekomst belangrijk kunnen worden met name deze drijvende krachten te benadrukken.

Een diepgaande analyse van het werkingsmechanisme van determinanten van voedingsvoorlichtingsgedrag van huisartsen wordt beschreven in hoofdstuk 5. Het gepostuleerde model inzake het werkingsmechanisme van de determinanten van voedingsvoorlichtingsgedrag van huisartsen kon bevestigd worden met behulp van LISREL-analyse (LISREL staat voor analyse van lineaire structurele relaties). Het model houdt in dat voedingsvoorlichtingsgedragingen van huisartsen direct en significant bepaald worden door een klein aantal predisponerende factoren; drijvende krachten en gepercipieerde barrières kunnen daarbij optreden als significante intermediaire variabelen. De predisponerende factoren, drijvende krachten en gepercipieerde barrières werden geïdentificeerd. Op basis van een vergelijking van de LISREL-analyse met de resultaten van multiple regressie analyse (hoofdstuk 4) werd geconcludeerd dat wanneer alléén multiple regressie analyse gebruikt zou zijn om determinanten vast te stellen, dit geleid zou hebben tot het niet identificeren van belangrijke predisponerende factoren en van 'verborgen' intermediaire factoren en dus tot een incompleet begrip van het werkingsmechanisme van de determinanten. Het beleid gericht op het verbeteren van het voedingsvoorlichtingsgedragingen van huisartsen zou in de toekomst

kunnen profiteren van een LISREL-analyse van determinanten van voedingsvoorlichtingsgedragingen teneinde de effectiviteit te verhogen.

De voedingsinformatiebronnen en strategieën van voedingsvoorlichting die huisartsen gebruiken, worden beschreven in hoofdstuk 6. De vier belangrijkste bronnen van voedingsinformatie van huisartsen zijn de diëtist (72% van de respondenten gebruikt deze bron), wetenschappelijke literatuur (door 34% van de respondenten gebruikt), het Voorlichtingsbureau voor de Voeding (door 33% van de respondenten gebruikt) en de Hartstichting (21%). Vijfentachtig procent van de huisartsen rapporteerde dat ze actief waren in het zoeken naar voedings-informatie. In voedingsvoorlichting naar patiënten gebruikende huisartsen met name als methoden persoonlijk informeren van patiënten, verwijzing naar de diëtist en brochures in de spreekkamer. Als methoden ter verkrijging van informatie voor henzelf prefereerden huisartsen wetenschappelijke tijdschriften, postacademische voedingseducatie, congressen en studiedagen, en folders en brochures.

Een controle op de bekend zijn met de Body Mass Index leverde een positief resultaat op. Dit is bemoedigend, omdat behandeling van overgewicht en obesitas aanvangt met een valide vaststelling door de huisarts.

Een diepgaande discussie van de verkregen resultaten in dit proefschrift vindt plaats in hoofdstuk 7. In dit hoofdstuk worden ook aanbevelingen gedaan en wordt toekomstig noodzakelijk onderzoek beschreven. Gelukkigerwijs zijn de laatste 3 jaar verscheidene artikelen gepubliceerd over de geïnvolveerdheid van huisartsen met voedingsvoorlichting. Dit reflecteert de toenemende erkenning door de wetenschappelijke wereld van het belang van de huisarts in voedingsinformatie van patiënten en consumenten.

Annex 1 Wageningen PCPs Nutrition Practices Questionnaire with main results (given as percentages of respondents) (in Dutch language)

AGB Quantron

1	2	3	4

Mgr. Schaepmanlaan 55
5103 BB DONGEN
Tel.: 01623 - 84233

Het in kaart brengen van de dagelijkse gang van zaken in de praktijk bij huisartsen met betrekking tot voeding in het algemeen, alsmede het bepalen welke factoren van invloed zijn op de houding, kennis en het gedrag van de huisarts op het gebied van voeding en voedingsvoorlichting.

Deze vragenlijst is bestemd voor:

INVULTIJD

Wilt u hieronder aangeven op welk tijdstip u begint en eindigt met het invullen van de vragenlijst?

Begonnen om : ..... *uur* ..... *minuten*

Geëindigd op : ..... *uur* ..... *minuten*

Dongen, oktober 1992

Ond.nr.: 30.00.5250

AGB Quantron

S.V.P. GOED DOORLEZEN

Dongen, oktober 1992
05.00.2627.hve/mdb

Geachte mevrouw, mijnheer,

Graag willen wij u enkele aanwijzingen geven voor het invullen van deze vragenlijst.

1 Wilt u bij het beantwoorden van de vragen het cijfer **omcirkelen** dat staat gedrukt achter of onder het antwoord van uw keuze.

2 Bij enkele vragen ziet u bij de antwoordmogelijkheden de categorie '**Anders, nl.: .....**'. Dit biedt u de mogelijkheid om zelf een antwoord toe te voegen, dat niet voorkomt in de voorgedrukte antwoordcategorieën.

3 Bij enkele vragen verzoeken wij u het antwoord zelf op te schrijven in de vragenlijst. Dit is het geval bij vragen naar bijvoorbeeld aantallen, gewichten, leeftijd of een vraag waarin u wordt verzocht uw mening nader toe te lichten.

4 Bij de meeste vragen willen wij dat u slechts **één** antwoord omcirkelt van de antwoordmogelijkheden.

5 Bij de vragen waarbij meer dan één antwoord mogelijk is, staat dat steeds aangegeven **(MEER ANTWOORDEN MOGELIJK!)**

Wij zijn u zeer erkentelijk voor het invullen van deze vragenlijst en wensen u daarbij veel succes.

H.E. van Egmond
directeur AGB Quantron

A UW PERSOONLIJKE OPVATTING VAN UW TAAK ALS HUISARTS

geen antwoord

A1. In hoeverre bent u het eens of niet eens met de volgende uitspraken?

	HELEMAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELEMAAL NIET MEE EENS	
'Voorlichting over gezondheid vind ik een onderdeel van mijn taak als huisarts'	53	42	4	1	-	-
'Ik vind dat ik in het contact met de patiënt aandacht behoor te besteden aan persoonsgerichte preventie, ook zonder dat de patiënt daar expliciet om vraagt'	20	56	19	4	1	0%
'Voorlichting over voeding vind ik een onderdeel van mijn taak als huisarts'	16	60	20	4	0	0%
'Ik vind dat ik patiënten met een verhoogd risico voor bepaalde aandoeningen hierop behoor te onderzoeken, ook als er (nog) geen klachten zijn' (= preventieve anticipatie)	25	56	16	3	0	0%

A2. Hoe zou u uw taakopvatting over uw dagelijks handelen omschrijven op een lijn die loopt van geheel curatief (-1) tot geheel preventief (-10)?
U kunt dit aangeven door één van de getallen van '-1' tot en met '-10' te omcirkelen.

GEHEEL CURATIEF ⟷ GEHEEL PREVENTIEF

-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
0	7	39	27	12	6	7	1	0	-

1%

A3. En hoe zou u uw taakopvatting op het gebied van voedingsvoorlichting omschrijven op een lijn die loopt van geheel curatief (-1) tot geheel preventief (-10)?
U kunt dit aangeven door één van de getallen van '-1' tot en met '-10' te omcirkelen.

GEHEEL CURATIEF ⟷ GEHEEL PREVENTIEF

-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
0	10	13	14	19	11	17	12	4	0

0%

A4. Tot wiens taak behoort volgens u de behandeling van overgewicht?

BEHANDELING VAN OVERGEWICHT:	MIJ ALS HUISARTS	DE DIËTIST	BEIDEN, ZOWEL VAN MIJ ALS VAN DE DIËTIST
behoort tot de taak van	4	7	88

0%

A5. Rekent u het tot uw taak als huisarts om voedingsvoorlichting te geven, als het gaat om:

	ZEER ZEKER	ZEKER	NIET DIRECT	ZEKER NIET	geen antwoord
Primaire preventie (maatregelenen om negatieve ontwikkelingen te voorkomen)	13	47	37	3	0%
Secundaire preventie (opsporen van negatieve ontwikkelingen in een vroegtijdig, presymptomatisch stadium en vervolgens behandelen)	18	62	19	1	0%
Tertiaire preventie (maatregelen om verdere complicaties te voorkomen)	50	42	7	1	0%

A6. In hoeverre bent u het eens of oneens met de volgende uitspraken?

	HELEMAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELEMAAL NIET MEE EENS	
Ik vind dat ik voorlichting moet geven over de risico's voor hart- en vaatziekten, die gepaard gaan met een verhoogd serum cholesterolgehalte	37	54	7	1	1	0%
Ik vind dat ik voedingsadviezen ter behandeling van hart- en vaatziekten moet geven	31	50	14	4	1	0%
Ik vind dat ik voedingsadviezen ter preventie van hart- en vaatziekten moet geven	18	50	27	5	0	0%
Ik vind dat ik de 'Standaard Cholesterol' van het Nederlands Huisartsen Genootschap (NHG) actief moet hanteren om de patiënten goed te kunnen behandelen en van goede voedingsadviezen te kunnen voorzien	28	51	16	4	1	0%
Ik vind dat ik objectieve criteria moet kennen om te kunnen vaststellen of iemand overgewicht heeft of niet	29	53	12	5	1	0%
Ik vind dat ik alleen moet uitgaan van objectieve criteria om vast te stellen of iemand overgewicht heeft of niet	18	40	22	17	3	0%

A7. In welke mate bent u het er mee eens of oneens dat u de onderstaande brochures of folders bij de hand behoort te hebben in uw spreekkamer?

	HELE-MAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELE-MAAL NIET MEE EENS	KEN IK NIET	geen antwoord
De brochure 'Spelregels voor goede voeding' van het Voorlichtingsbureau voor de Voeding?	10	34	28	13	1	13	0%
Een brochure of folder over hyper-cholesterolemie?	25	55	12	6	1	1	0%
De brochure 'Lekker eten ..... maar zonder al te veel vet' van het Voor-lichtingsbureau voor de Voeding?	7	28	33	16	2	13	1%
Een brochure of folder over 'overge-wicht'?	15	45	25	9	2	4	0%
De brochure 'Een geheugensteuntje voor gezonde eters' van het Voorlichtingsbureau voor de Voeding?	5	20	37	17	2	19	0%

A8. In welke mate bent u het eens of niet eens met onderstaande uitspraken?

	HELE-MAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELE-MAAL NIET MEE EENS	
Ik vind het mijn taak als huisarts om patiënten uitgebreid voor te lichten over de te volgen behandelingsmethode	27	58	12	3	0	0%
Ik vind het mijn taak als huisarts om met patiënten uitgebreid te overleggen over de te volgen behandelings-methode	24	55	17	4	0	0%
Ik vind dat patiënten inspraak moeten kunnen hebben bij de keuze van een behandelingsmethode	31	57	11	1	0	0%

A9. In welke mate vindt u het voor uzelf belangrijk of niet belangrijk om jaarlijks tijd vrij te maken voor de volgende vormen van na- en bijscholing?

	ZEER BELANG-RIJK	BELANG-RIJK	BELANGRIJK / NOCH ON-BELANGRIJK	NIET BELANG-RIJK	HELE-MAAL NIET BELANG-RIJK	
Na- en bijscholing in het algemeen	62	37	0	0	-	0%
Na- en bijscholing, specifiek op het gebied van voeding	2	40	49	8	1	0%

A10. Vindt u dat u het goede voorbeeld moet geven aan uw patiënten qua leefgewoonten en qua voedingsgewoonten?

	HELE-MAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELE-MAAL NIET MEE EENS	geen antwoord
Leefgewoonten	12	42	24	15	7	0%
Voedingsgewoonten	10	39	27	16	7	1%

B ORGANISATIES, INSTANTIES EN RICHTLIJNEN OP HET TERREIN VAN VOEDING EN VOEDINGSVOORLICHTING

geen antwoord

B1. Hieronder staat een aantal organisaties en instanties.
Wilt u van elk daarvan aangeven in welke mate uzelf denkt op de hoogte te zijn van de informatie en voorlichting die zij verstrekken?

	HIERVAN BEN IK ..... OP DE HOOGTE						
	ZEER GOED	GOED	NIET ZO GOED	SLECHT	HEEL SLECHT	KEN IK NIET	
De Nederlandse Hartstichting	6	64	24	4	1	0	1%
Het Voorlichtingsbureau voor de Voeding	5	46	36	10	2	0	1%
De Stichting Zuivel, Voeding & Gezondheid	1	13	41	29	7	8	1%
Het Voorlichtingsbureau Brood	0	3	24	35	13	25	0%
Het Voorlichtingsbureau Vlees	0	7	26	34	15	16	1%
De Voedingsraad	0	8	27	29	16	19	1%
De Stichting Voeding Nederland	-	1	13	25	12	48	1%
De Stuurgroep Goede Voeding	0	1	13	22	9	54	1%

B2. Heeft u in de laatste 2 jaar wel eens contact opgenomen met één of meerdere van de volgende organisaties of instanties om informatie te krijgen over voeding? Zo ja, welke?
(MEER ANTWOORDEN MOGELIJK!)

De Nederlandse Hartstichting	22
Het Voorlichtingsbureau voor de Voeding	33
De Stichting Zuivel, Voeding & Gezondheid	2
Het Voorlichtingsbureau Brood	0
Het Voorlichtingsbureau Vlees	0
De Voedingsraad	0
De Vakgroep Humane Voeding van de Landbouwuniversiteit Wageningen	4
De Stichting Voeding Nederland	-
De Stuurgroep Goede Voeding	0
De diëtist	72
Ik zoek het (ook) op in de literatuur	34
Anders, nl.:	12
Geen van de bovenstaande organisaties of instanties	15

0%

B3. In hoeverre bent u inhoudelijk op de hoogte van:

	HIERVAN BEN IK ..... OP DE HOOGTE						geen antwoord
	ZEER GOED	GOED	NIET ZO GOED	SLECHT	HEEL SLECHT	KEN IK NIET	
De Richtlijnen 'Goede Voeding' van de Voedingsraad	3	29	34	15	6	11	2%
De 'Spelregels voor Goede Voeding' van het Voorlichtingsbureau voor de Voeding?	2	21	35	18	6	15	3%
De 'Standaard Cholesterol' van het Nederlands Huisartsen Genootschap (NHG)	24	67	6	1	0	0	2%

B4. Kent u het VoedingsMagazine?

Ja 35
Nee ..... 64 → **DOOR NAAR VRAAG B6** 1%

B5. Hoeveel van de laatste zes nummers van VoedingsMagazine heeft u gelezen of ingezien?
Als u het aantal niet precies weet, wilt u dan een zo nauwkeurig mogelijke schatting maken?

[ ] NUMMERS

B6. Welk maximaal gewicht in kilogrammen acht u nog net acceptabel voor:

Een gezonde man tussen 30 en 50 jaar met een lengte van 179 cm? [ ] KG

Een gezonde vrouw tussen 30 en 50 jaar met een lengte van 173 cm? [ ] KG

C VOEDING EN GEZONDHEID

geen antwoord

C1. In welke mate bent u geïnteresseerd in de invloed van voeding op de gezondheid?

Zeer geïnteresseerd	10
Redelijk geïnteresseerd	60
Neutraal	25
Nauwelijks geïnteresseerd	3
Helemaal niet geïnteresseerd	0

2%

C2. Hieronder staat een aantal factoren die mede van invloed kunnen zijn op de gezondheid. Wilt u van elke factor aangeven in welke mate deze - naar uw mening - van invloed is op de gezondheid?
U kunt dit doen door één van de getallen van '-1' tot en met '-10' te omcirkelen.

	HEEL WEINIG INVLOED ←									HEEL VEEL INVLOED →	
	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	
Lichaamsbeweging	0	1	1	1	3	4	18	35	18	18	1%
Spanningen	0	0	1	2	5	7	17	30	21	16	1%
Hygiëne	1	3	5	5	12	16	24	18	9	5	2%
Voedingspatroon	0	0	1	2	3	8	25	36	15	7	2%
Alcoholgebruik	0	1	1	0	3	6	21	31	22	13	2%
Roken	1	0	0	-	1	2	5	17	28	44	1%
Erfelijke aanleg	0	1	1	2	7	11	19	28	15	14	2%

C3. In welke mate bent u het wel of niet eens met de volgende stellingen?

	HELEMAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELEMAAL NIET MEE EENS	geen antwoord
Personen met gezondheidsproblemen passen hun leefgewoonten moeilijk aan	8	51	29	10	1	1%
Personen met gezondheidsproblemen passen hun voedingsgewoonten moeilijk aan	10	54	24	11	0	1%
Ik kan als huisarts weinig invloed uitoefenen op de leefgewoonten van personen met gezondheidsproblemen	4	22	33	39	2	0%
Ik kan als huisarts weinig invloed uitoefenen op de voedingsgewoonten van personen met gezondheidsproblemen	3	22	33	41	1	0%
In de dagelijkse praktijk kom ik er doorgaans niet toe om voedingsvoorlichting te geven	4	22	28	40	5	1%

C4. Hieronder staat een aantal factoren die u als huisarts wel of niet zouden kunnen belemmeren om algemene voedingsvoorlichting te geven.
Wilt u van elk van deze factoren aangeven of deze voor uzelf wel of niet vindt gelden?

	VRAAG C4		VRAAG C5
	VIND IK		DRIE BELANGRIJKSTE BELEMMERINGEN
	WEL	NIET	
Behoort niet tot mijn taak	19	77	
Te weinig tijd hiervoor	56	42	
Onvoldoende kennis op dit gebied	58	39	
De wetenschap biedt te weinig kennis op dit terrein	20	76	
Onvoldoende vaardigheden op dit gebied	49	48	
Te kort aan na- of bijscholing op dit gebied	53	44	
Gebrek aan motivatie van de patiënten	50	46	
Het is een inbreuk op de privacy van de patiënt	9	88	
Ik voel mij op dit gebied niet zeker van mijn zaak	45	52	
Het ontbreken van financiële prikkels	19	77	
Anders, nl.:	4		

C5. Indien u bij twee of meer factoren 'wel' (-1) heeft omcirkeld bij vraag C4, wilt u dan door het toekennen van de cijfers '1', '2' en '3' aangeven welke van die factoren voor u het meest belemmerend werken? ('1' = meest belemmerend)

D BEHANDELING VAN OVERGEWICHT IN UW HUISARTSENPRAKTIJK

D1. In welke mate bent u het wel of niet eens met elk van onderstaande stellingen?

	HELE-MAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELE-MAAL NIET MEE EENS	geen antwoord
Behandeling van overgewicht is tijdverspilling	2	11	29	51	6	1%
Mensen met een iets te hoog lichaamsgewicht lopen ook gezondheidsrisico's	2	32	31	29	5	1%
Patiënten met klachten ten gevolge van overgewicht worden door mijzelf voor hun overgewicht behandeld	4	42	36	16	1	1%
Patiënten met bepaalde klachten, die niet samenhangen met hun overgewicht, worden door mij ook voor hun overgewicht behandeld	2	21	34	35	7	1%
Als patiënten willen afvallen, wil ik eerst vaststellen of ze werkelijk te zwaar zijn	23	60	7	8	1	1%
Ik kan met een patiënt, die moet afvallen, goed bespreken wat de beste manier is om af te vallen	7	61	24	6	1	1%
Voor patiënten, die moeten afvallen, heb ik als aanvulling op de mondelinge uitleg goede schriftelijke informatie	7	42	18	28	4	1%
Voor behandeling van patiënten met overgewicht kan ik terugvallen op een diëtist	41	53	3	1	1	1%
Ik acht mijzelf succesvol in het behandelen van patiënten met overgewicht	1	10	50	33	5	1%
Voor behandeling van patiënten met overgewicht verwijs ik door naar een diëtist	17	37	37	8	1	0%

D2. Wilt u aangeven welk van de onderstaande uitspraken op u van toepassing is?
(ÉÉN ANTWOORD!)

		geen antwoord
Patiënten met overgewicht behandel ik bij voorkeur zelf	33	
Patiënten met overgewicht verwijs ik direct door naar de diëtist	24	
Patiënten met overgewicht stuur ik direct door naar een andere instantie	3	
Patiënten met overgewicht behandel ik bij voorkeur in overleg met de diëtist	37	3%

Waarom handelt u op deze wijze?

D3. Hieronder staat een aantal factoren die de huisarts wel of niet zouden kunnen belemmeren om overgewicht te behandelen.
Wilt u van elk van deze factoren aangeven of deze voor uzelf wel of niet vindt gelden?

	VRAAG D3		VRAAG D4	VRAAG D5
	VIND IK		DRIE BELANGRIJKSTE BELEMMERINGEN BEHANDELING	DRIE BELANGRIJKE BELEMMERINGEN PREVENTIE
	WEL	NIET		
behoort niet tot mijn taak	15	82		
te weinig tijd hiervoor	48	50		
onvoldoende kennis op dit gebied	36	62		
onvoldoende kennis en vaardigheden om overgewicht vast te stellen	6	91		
onvoldoende na- of bijscholing gevolgd voor diagnose, behandeling en preventie van overgewicht	36	61		
onvoldoende kennis en vaardigheden om overgewicht effectief te behandelen	38	59		
gebrek aan motivatie van de patiënten	65	33		
de patiënten haken zelf af tijdens de behandeling	72	25		
ik voel mij op dit gebied niet zeker van mijn zaak	22	74		
de meeste methoden hebben ofwel geen ofwel een averechts effect	28	68		
het ontbreken van financiële prikkels	18	79		
te weinig tijd voor het stimuleren van de patiënt tijdens de behandeling	45	52		

D4. Indien u bij twee of meer factoren 'wel' (-1) heeft omcirkeld bij vraag D3, wilt u dan - door het toekennen van de cijfers '1', '2' en '3' - aangeven welke van die factoren voor u het meest belemmerend werken? ('1' = meest belemmerend)

D5. Welke drie factoren van de 12 die hierboven staan, vindt u het meest belemmerend voor u werken als het gaat om preventie van overgewicht? Wilt u deze drie meest belemmerende factoren weer aangeven door het toekennen van de cijfers '1', '2' en '3', waarbij de factor die u een '1' geeft volgens u het meest belemmerend werkt?

E BEHANDELING EN PREVENTIE VAN HART- EN VAATZIEKTEN IN UW HUISARTSENPRAKTIJK

geen antwoord

E1. In welke mate bent u het wel of niet eens met elk van onderstaande uitspraken?

	HELE-MAAL MEE EENS	MEE EENS	EENS / NOCH ONEENS	NIET MEE EENS	HELE-MAAL NIET MEE EENS	geen antwoord
Het is een goede zaak dat het Nederlands Huisartsen Genootschap (NHG) nu een 'Standaard Cholesterol' heeft	51	42	5	1	1	0%
De 'Standaard Cholesterol' van het Nederlands Huisartsen Genootschap (NHG) is in mijn praktijk uitvoerbaar	28	57	12	2	1	0%
Ik weet voldoende van voeding om voedingsadviezen te kunnen geven ter behandeling van hart- en vaatziekten	9	49	30	10	1	1%
Een huisarts is niet opgeleid om hart- en vaatziekten op te sporen	1	11	17	49	22	0%
Ik weet voldoende van voeding om voedingsadviezen te kunnen geven ter preventie van hart- en vaatziekten	9	53	28	9	0	1%

E2. Hieronder staat een aantal factoren die de huisarts wel of niet zouden kunnen belemmeren om hart- en vaatziekten te behandelen.
Wilt u van elk van deze factoren aangeven of deze voor uzelf wel of niet vindt gelden?

	VRAAG E2		VRAAG E3	VRAAG E4
	VIND IK		DRIE BELANGRIJKSTE BELEMMERINGEN BEHANDELING	DRIE BELANGRIJKSTE BELEMMERINGEN PREVENTIE
	WEL	NIET		
behoort niet tot mijn taak	6	92		
te weinig tijd hiervoor	11	86		
onvoldoende kennis op dit gebied	10	87		
onvoldoende kennis en vaardigheden om hart- en vaatziekten vast te stellen	10	88		
onvoldoende na- of bijscholing gevolgd voor diagnose, behandeling en preventie van hart- en vaatziekten	8	90		
onvoldoende kennis en vaardigheden om hart- en vaatziekten effectief te behandelen	14	83		
gebrek aan motivatie van de patiënten	23	74		
ik voel mij op dit gebied niet zeker van mijn zaak	12	85		
het ontbreken van financiële prikkels	10	87		
te weinig tijd voor het stimuleren van de patiënt tijdens de behandeling	17	80		
anders, nl.:	4			

E3. Indien u bij twee of meer factoren 'wel' (-1) heeft omcirkeld bij vraag E2, wilt u dan - door het toekennen van de cijfers '1', '2' en '3' - aangeven welke van die factoren voor u het meest belemmerend werken? ('1' = meest belemmerend)

E4. Welke drie factoren van de 11 die hierboven staan, vindt u het meest belemmerend voor u werken als het gaat om preventie van hart- en vaatziekten? Wilt u deze drie meest belemmerende factoren weer aangeven door het toekennen van de cijfers '1', '2' en '3', waarbij de factor die u een '1' geeft volgens u het meest belemmerend werkt?

F OVERGEWICHT IN DE DAGELIJKSE PRAKTIJK

geen antwoord

F1. Hoe vaak let u op het gewicht van uw patiënten?
Is dat ..... (ÉÉN ANTWOORD!)

Altijd	5
Meestal (bij meer dan 80% van alle patiënten)	23
Vaak (bij 50-80% van alle patiënten)	37
Af en toe (bij 20-50% van alle patiënten)	28
Zelden (bij minder dan 20% van alle patiënten)	5
Nooit	-

2%

F2. Hoe stelt u overgewicht vast?

(MEER ANTWOORDEN MOGELIJK!)

Met klinische blik	58
Met de Quetelet-index	65
Ga af op de mening van de patiënt	14
Met de Broca-index	11
Anders, nl.: ↙	
.....	10

0%

F3. Kent u het begrip Quetelet-index?

Ja	96
Nee	3

1%

F4. Maakt u onderscheid tussen overgewicht en obesitas?

Ja	51
Nee	46

3%

F5. Bij welke Quetelet-index (QI) is er volgens de Gezondheidsraad sprake van overgewicht?

7%

	OVERGEWICHT	OBESITAS
Onbekend	16	20
QI > 30	6	63
25 < QI ≤ 30	65	5
20 ≤ QI ≤ 25	5	1
QI < 20	0	0

En bij welke Quetelet-index (QI) is er volgens de Gezondheidsraad sprake van obesitas?

10%

F6. Wilt u aangeven of de volgende uitspraken wel of niet op u van toepassing zijn?

	HELEMAAL VAN TOEPASSING	WEL VAN TOEPASSING	NAUWELIJKS VAN TOEPASSING	HELEMAAL NIET VAN TOEPASSING	geen antwoord
Ik behandel mensen met overgewicht alleen als zij het zelf willen	42	49	7	1	0%
Als ik vind dat iemand moet afvallen, bespreek ik altijd met hem/haar wat de oorzaken van het te zwaar zijn zouden kunnen zijn	26	67	6	1	1%
Als ik vind dat iemand moet afvallen, bespreek ik altijd met hem/haar wat de beste manier is	23	69	7	0	1%
Als ik vind dat iemand moet afvallen en hij/zij wil dat niet, dan wijs ik steeds op de gezondheidsrisico's	22	65	11	1	1%
Ik adviseer alle patiënten die te zwaar te zijn om af te vallen	11	44	37	7	1%
Ik adviseer patiënten met overgewicht alleen dan om te vermageren als de klacht of het ziekteverloop daartoe aanleiding geeft	7	35	42	15	1%

G DE DAGELIJKSE GANG VAN ZAKEN IN UW PRAKTIJK BETREFFENDE VOEDINGSVOORLICHTING

geen antwoord

SCHRIFTELIJK VOORLICHTINGSMATERIAAL IN DE SPREEKKAMER

G1. Hoe vaak krijgt u in uw praktijk patiënten met een ziekte of klacht, waarbij voeding een rol speelt?

Als u het aantal niet precies weet, wilt u dan een zo nauwkeurig mogelijke schatting maken?

Is dat ..... (ÉÉN ANTWOORD!)

Nooit ..... 0 — 1%

☐ patiënten per dag ☐ patiënten per week ☐ patiënten per maand

G2. Hoe vaak geeft u aan uw patiënten voorlichting over voeding?

Als u het aantal niet precies weet, wilt u dan een zo nauwkeurig mogelijke schatting maken?

Is dat ..... (ÉÉN ANTWOORD!)

Nooit ..... 0 → VERDER MET VRAAG H1

☐ patiënten per dag ☐ patiënten per week ☐ patiënten per maand — 0%

G3. Is uw voorlichting over voeding in het algemeen:

GEHEEL CURATIEF ⟷ GEHEEL PREVENTIEF

-1	-2	-3	-4	-5	-6	-7	-8	-9	-10
0	3	13	21	27	15	12	7	1	0

0%

G4. Wilt u van elk van de onderstaande folders en brochures aangeven op welke wijze u deze gebruikt in uw spreekkamer?

(MEER ANTWOORDEN PER FOLDER / BROCHURE MOGELIJK!)

	IK VERWIJS ERNAAR	IK CITEER ERUIT	LAAT ERUIT LEZEN	IK DEEL ZE UIT	N.V.T.	
Lekker eten ..... maar zonder al te veel vet →	14	1	2	19	65	3%
Geheugensteuntje voor Gezonde Eters →	7	1	1	6	82	4%
Folder over overgewicht →	14	3	2	42	43	2%

G5. Maakt u bij het geven van voedingsvoorlichting gebruik van:

	KEN IK NIET	AANTAL KEER PER DAG	AANTAL KEER PER WEEK	AANTAL KEER PER MAAND	NOOIT	geen antwoord
het advies 'Richtlijnen Goede Voeding' van de Voedingsraad?	16				40	4%
de op dit advies gebaseerde 'Spelregels voor Goede Voeding' van het Voorlichtingsbureau voor de Voeding?	23				50	4%
het op dit advies gebaseerde 'Geheugensteuntje voor Gezonde Eters' van het Voorlichtingsbureau voor de Voeding?	31				55	3%

G6. Als u voorlichting geeft over voeding doet u dat dan:

(MAXIMAAL 2 ANTWOORDEN!)

uitsluitend mondeling door uzelf	28	
door een combinatie van mondelinge voorlichting en het meegeven van folders en brochures	71	
uitsluitend door het meegeven van folders en brochures	2	
door middel van een gesprek van de patiënt met de doktersassistent(e)	5	
door te verwijzen naar de diëtist	72	0%

G7. Als u folders en brochures meegeeft aan u patiënt, heeft u deze dan ook zelf gelezen of ingezien?

Ja, altijd	27	
Ja, meestal wel	41	
Soms wel, soms niet	18	
Nee, meestal niet	4	
Nee, nooit	0	
Niet van toepassing	8	1%

H WIJZE WAAROP VOORLICHTING OVER VOEDING KAN WORDEN GEGEVEN

geen antwoord

H1. Er zijn verschillende manieren om mensen te informeren over voeding. Hierbij kan onderscheid worden gemaakt tussen het publiek/de patiënten enerzijds en de mensen die beroepshalve te maken hebben met voeding anderszijds.

Hieronder staat een aantal manieren waarop het publiek/de patiënten over voeding kunnen worden geïnformeerd in uw praktijk.

Wilt u van elke manier aangeven in hoeverre u deze:
- in beginsel doeltreffend vindt;
- en in uw eigen praktijk uitvoerbaar acht?

	VRAAG H1						VRAAG H2			
	IN BEGINSEL ..... DOELTREFFEND			..... UITVOERBAAR IN MIJN PRAKTRIJK			TOEPASSING			
	ZEER	REDE-LIJK	NIET ZO	ZEER GOED	REDE-LIJK GOED	NIET ZO GOED	NOOIT	NIET MEER	MOMEN-TEEL WEL	
Folders/brochures in de spreekkamer	17	66	15	51	39	8	7	10	80	2/2/3%
Videopresentaties	12	47	38	3	8	87	93	1	3	3/2/3%
Tijdschriften voor patiënten	5	54	40	24	46	28	53	10	34	2/2/4%
Voorlichtingsbijeenkomsten voor patiënten	25	50	23	6	20	71	79	9	8	2/2/3%
Persoonlijke gesprekken met patiënten	52	46	2	55	39	4	2	3	92	1/2/3%
Gesprek met praktijkassistente	17	51	30	17	34	47	59	7	32	2/2/3%
Ik laat de patiënt contact opnemen voor afspraak met de diëtist	49	47	3	67	28	3	2	3	93	1/2/3%
Telefonische voorlichting naar aanleiding van vragen	9	43	46	22	43	33	35	6	57	2/2/3%
Voorlichtingscampagnes van de overheid (bijv. 'Let op Vet')	10	54	34	13	35	39	50	12	23	1/12/14 %

H2. Wilt u van elke manier, om het publiek/de patiënten te informeren, aangeven of u deze in uw dagelijkse praktijk nooit heeft toegepast, wel heeft toegepast maar momenteel niet meer of momenteel toepast?

H3. Wilt u nu aangeven in hoeverre u de hieronder genoemde manieren om huisartsen over voeding te informeren in beginsel doeltreffend vindt?

	VRAAG H3			VRAAG H4			geen antwoord
	IN BEGINSEL ..... DOELTREFFEND			..... VOOR MIJ VAN TOEPASSING			
	ZEER	REDE-LIJK	NIET ZO	ZEER GOED	REDE-LIJK GOED	NIET ZO GOED	
Wetenschappelijke tijdschriften	25	59	15	24	53	22	0/1%
Populair-wetenschappelijke tijdschriften	7	38	53	7	30	61	1/3%
VoedingsMagazine	7	45	46	7	29	61	2/3%
Folders en brochures	17	57	24	18	49	31	1/2%
Congressen en studiedagen	29	52	18	18	41	39	1/2%
Nascholingscursussen over voeding	46	45	9	31	39	28	1/1%
Videopresentaties	11	38	49	9	19	69	1/3%
Persoonlijke gesprekken	24	39	36	17	28	52	1/3%
Telefonische voorlichting naar aanleiding van vragen	9	32	58	6	21	70	1/3%

H4. Wilt u van elke manier van informeren aangeven of u deze voor uzelf van toepassing vindt?

	geen antwoord
H5. Krijgt u de laatste twee jaar van uw patiënten op voedingsgebied	0%

	KRIJGT	VERWACHT
meer vragen dan vroeger	60	63
evenveel vragen als vroeger	28	34
minder vragen dan vroeger	2	1

Verwacht u van uw patiënten in de nabije toekomst op voedingsgebied 2%

H6. Geven de media (radio, TV, dagbladen, tijdschriften) naar uw mening de laatste twee jaar aan voeding 1%

	GEVEN	VERWACHT
meer aandacht dan vroeger	82	72
evenveel aandacht als vroeger	16	23
minder aandacht dan vroeger	1	2

Verwacht u van de media in de toekomst over voeding 3%

H7. Geeft u de laatste twee jaar uit eigen initiatief aan uw patiënten 0%

	GEVEN	VERWACHT
meer voorlichting over voeding dan vroeger	48	51
evenveel voorlichting over voeding als vroeger	49	46
minder voorlichting over voeding dan vroeger	3	2

Wat verwacht u in de nabije toekomst aan uw patiënten uit eigen initiatief te geven: 1%

J PERSOONLIJKE KENMERKEN

geen antwoord

J1. Wat is uw geboortedatum? dag: [ ] maand: [ ] jaar: [ ]

J2. In welk jaar bent u afgestudeerd als arts? afgestudeerd in [ ]

Sinds wanneer bent u zelfstandig gevestigd als huisarts? maand: [ ]

jaar: [ ]

J3. Wat is uw gewicht in kg? [ ] kg.

J4. Wat is uw lengte in cm? [ ] cm.

J5. Rookt u?

Ja	20	
Nee, niet meer	27	
Nee	53	-

J6. Gebruikt u voedingssupplementen?

Ja	7	
Nee	93	0%

J7. Volgt u een dieet of bepaalde voedingsvoorschriften?

Nee	87	
Ja, nl.: ↘		
	13	0%

J8. Is uw levenspartner geïnteresseerd in de gezondheidsaspecten van voeding? Is hierbij sprake van:

Zeer geïnteresseerd	14	
Redelijk geïnteresseerd	48	
Neutraal	24	
Nauwelijks geïnteresseerd	8	
Helemaal niet geïnteresseerd	3	
Niet van toepassing	3 → VERDER MET VRAAG J10	0%

J9. Volgt uw levenspartner een dieet of bepaalde voedingsvoorschriften?

Nee	81	
Ja, nl.: ↘		
	14	
N.v.t.	3	1%

		geen antwoord
J10.	Praat u wel eens over de gezondheidsaspecten van voeding met .....? **(MEER ANTWOORDEN MOGELIJK!)**	
	uw levenspartner (indien van toepassing) 79	
	collega's 51	
	een diëtist 50	
	geen van de bovenstaande personen / functionarissen 9	0%
J11.	Onderstaand ziet u een aantal uitspraken over hart en bloedvaten. Wilt u aangeven welke uitspraak het meest op u van toepassing is? **(ÉÉN ANTWOORD!)**	
	Ik trek mij van al dat gepraat over hart en bloedvaten voor wat mijn eten betreft niets aan 2	
	Ik houd in verband met mijn hart en bloedvaten eigenlijk weinig rekening met wat ik eet 17	
	Ik zou in verband met mijn hart en bloedvaten echt wat meer rekening moeten houden met wat ik eet en ik doe dat ook wel zo nu en dan 26	
	Ik houd met mijn eten echt wel rekening met wat goed is voor mijn hart en bloedvaten 45	
	Ik houd een gematigd dieet, omdat ik vind dat ik wat moet oppassen voor mijn hart en bloedvaten 9	
	Ik houd een streng dieet, omdat ik vind dat ik, in verband met mijn hart en bloedvaten, echt goed moet oppassen 0	1%
J12.	Onderstaand ziet u een aantal uitspraken over het gewicht. Wilt u aangeven welke uitspraak het meest op u van toepassing is? **(ÉÉN ANTWOORD!)**	
	Ik hoef helemaal niet bang te zijn om dik te worden 30	
	Ik moet misschien wel een beetje op mijn gewicht letten, maar ja, meestal komt het er niet van 11	
	Ik zou echt wel wat meer op mijn gewicht moeten letten en ik doe dat ook weleens zo nu en dan 17	
	Ik let wel regelmatig op mijn gewicht 37	
	Ik houd een gematigd dieet, omdat ik vind dat ik wat moet afvallen 5	
	Ik houd een streng dieet, omdat ik vind dat ik nodig wat moet afvallen 0	0%

K ORGANISATIE VAN DE PRAKTIJK

geen antwoord

K1. Uit hoeveel patiënten bestaat uw praktijk ongeveer?
Indien u werkzaam bent in een duo- of groepspraktijk, wilt u dan aangeven hoeveel patiënten u tot uw verantwoordelijkheid rekent?

Minder dan 1.500 patiënten	9
1.500 - 1.599 patiënten	6
1.600 - 1.699 patiënten	3
1.700 - 1.799 patiënten	3
1.800 - 1.899 patiënten	3
1.900 - 1.999 patiënten	3
2.000 - 2.099 patiënten	6
2.100 - 2.199 patiënten	5
2.200 - 2.299 patiënten	6
2.300 - 2.399 patiënten	7
2.400 - 2.499 patiënten	8
2.500 - 2.599 patiënten	6
2.600 - 2.699 patiënten	7
2.700 - 2.799 patiënten	7
2.800 - 2.899 patiënten	5
2.900 - 2.999 patiënten	5
3.000 - 3.499 patiënten	9
3.500 - 3.999 patiënten	1
4.000 patiënten of meer	1

0%

K2. Hoeveel patiënten ziet u gemiddeld op een dag?
En hoeveel tijd trekt u gemiddeld uit per patiënt tijdens het spreekuur?

gemiddeld ☐ patiënten op een dag

gemiddeld ☐ minuten per patiënt

K3. Welk registratiesysteem gebruikt u?

'Groene NHG-kaart'	64
(Personal) computer met medische module	17
Gezinsmappen	9
Anders, nl.: ↙	
	9

1%

In het voorjaar van 1993 is een afsluitende onderzoekfase gepland in het kader van dit onderzoekprogramma.

Zou u willen aangeven of u bereid bent deel te nemen aan de onderstaande vormen van vervolgonderzoek?

	JA	NEE	geen antwoord
schriftelijk onderzoek, zoals deze vragenlijst	74	23	3%
telefonisch onderzoek	20	67	13%
mondeling onderzoek	28	60	12%

INCENTIVE

geen antwoord

Wij zijn u zeer erkentelijk voor het beantwoorden van de vragen in deze vragenlijst.
Graag bieden wij u een tegemoetkoming ter waarde van *f* 50,-- aan voor de genomen moeite.

Wilt u uw voorkeur kenbaar maken aan de hand van de onderstaande mogelijkheden:

- een boekenbon 19
- een platen-/CD-bon 36
- een VVV-bon 34
- een donatie uit uw naam aan het volgende goede doel / instantie [11]

0%

Wij zullen ervoor zorgdragen dat uw voorkeur per omgaande wordt gehonoreerd.

NOGMAALS ONZE HARTELIJKE DANK VOOR UW MEDEWERKING!

Annex 2 Letter of invitation to PCPs to participate in the survey, with enclosures (in Dutch language) (name and address are fictive)

Vakgroep Humane Voeding

Landbouwuniversiteit **Wageningen**

uw kenmerk
uw brief van
ons kenmerk
bijlage(n)
datum
behandeld door
toestelnummer
onderwerp

05.00.2627.hve/nz

Wageningen, 14 oktober 1992

De Weledelgeleerde Heer
P.A.J. Nieuwenhuis
Huisarts
Havenplein 33
3346 PA PAPENDRECHT

Geachte heer Nieuwenhuis,

Steeds meer mensen raken geïnteresseerd in voeding. Recent onderzoek in Nederland heeft aangetoond dat de huisarts door de consument wordt gezien als een betrouwbaar baken op het terrein van voorlichting over voeding. De huisarts - u in het kader van uw patiëntenzorg - beweegt zich onder meer op het raakvlak van voeding en gezondheid: hoe past u voeding toe in uw zorg, zowel in curatieve als in preventieve zin.

75 JAAR
1918-1993

LANDBOUW UNIVERSITEIT WAGENINGEN

Wij vragen uw medewerking aan een landelijk onderzoek naar de houding, de kennis, het gedrag, de mogelijkheden en belemmeringen die huisartsen tijdens de dagelijkse werkzaamheden hebben of ervaren op het gebied van voeding en gezondheid.
De doelstelling van het onderzoek is als volgt geformuleerd:

het in kaart brengen van de dagelijkse gang van zaken in de praktijk bij huisartsen met betrekking tot voeding in het algemeen, alsmede

het bepalen welke factoren van invloed zijn op de houding, kennis en het gedrag van de huisarts op het gebied van voeding en voedingsvoorlichting.

De eindverantwoordelijkheid van het onderzoek berust bij ir G.J. Hiddink, wetenschappelijk onderzoeker van de Stichting Zuivel, Voeding & Gezondheid.
De begeleidingsgroep bestaat uit de ondertekenaars van deze brief. De praktische uitvoering van het onderzoek is opgedragen aan AGB Quantron, een onafhankelijk bureau voor marktonderzoek te Dongen (N.Br.).

Concreet is ons verzoek aan u de bijgevoegde vragenlijst in te vullen en aan AGB Quantron te retourneren. Uit vooronderzoek is gebleken dat het invullen van de vragenlijst gemiddeld ongeveer 40 minuten duurt. Als tegenprestatie willen wij u graag iets aanbieden ter waarde van *f* 50,--. Nadere bijzonderheden hieromtrent treft u aan in de bijlage.

Tevens willen wij, als blijk van waardering, zes respondenten (a-select bepaald) met partner uitnodigen voor een geheel verzorgd weekend in Hotel Restaurant de Swaen (Cas Spijkers) in Oisterwijk (of elders naar keuze).

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WHO Collaborating Centre for Nutrition

Mocht u nadere informatie wensen, dan kunt u zich wenden tot:
- op maandagavond 19 oktober a.s. van 19.00 uur tot 22.00 uur:
  - Prof. dr C.M.J. van Woerkum, 08370 - 10308
  - Dr C.J. Fieren, 08370 - 25006
- op maandagavond 26 oktober a.s. van 19.00 uur tot 22.00 uur:
  - Prof. dr J.G.A.J. Hautvast, 08370 - 10609
- Stichting Zuivel, Voeding & Gezondheid,
  - Ir G.J. Hiddink, 030 - 412241
- AGB Quantron,
  - de heer H.E. van Egmond, 01623 - 84000

Vertrouwend op uw medewerking te mogen rekenen en u bij voorbaat hartelijk dankend,

Prof. dr J.G.A.J. Hautvast, arts
vanaf 1972 hoogleraar
Humane Voeding,
Landbouw Universiteit Wageningen

Prof. dr C.M.J. van Woerkum,
vanaf 1989 hoogleraar
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Dr C.J. Fieren,
vanaf 1967 huisarts te Wageningen,
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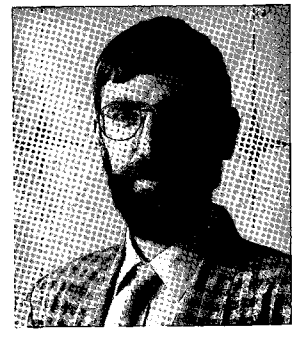
actief in wetenschap en praktijk



Ir G.J. Hiddink,
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Stichting Zuivel, Voeding &
Gezondheid, Maarssen

AGB QUANTRON

Dongen, 14 oktober 1992
05.00.2627.hve/kvdn

Bijlage bij de introductiebrief van de Landbouw Universiteit Wageningen

Het onderzoekprogramma - waarvan deze studie een onderdeel vormt - is als volgt gefaseerd:

- uitgebreide literatuurstudie;
- gesprekken met specialisten op dit vakgebied;
- twee fasen kwalitatief vooronderzoek onder huisartsen;
- deze studie;
- een mondelinge onderzoekfase in 1993.

De praktische uitvoering is in handen van AGB Quantron, een divisie van AGB Dongen b.v., een onafhankelijk bureau voor marktonderzoek te Dongen (Noord-Brabant). Dit bureau draagt zorg voor:

- het trekken van de steekproef op basis van het NIVEL-bestand;
- het verzenden en verwerken van de vragenlijsten;
- het rapporteren van de uitkomsten.

Over de resultaten van het onderzoek zal te zijner tijd regelmatig worden gepubliceerd in de medische vaktijdschriften. Tevens zenden wij u graag een korte samenvatting met de belangrijkste resultaten na afloop van het onderzoek.

Bij de uitvoering van het onderzoek houdt dit bureau zich aan de gedragscode, zoals deze is neergelegd in de ICC/E.S.O.M.A.R. International Code of Marketing and Social Practice.
In deze gedragscode wordt onder meer de anonimiteit van de ondervraagden geheel gegarandeerd (zie bijlage, Rules - A, article 2).

Wilt u de ingevulde vragenlijst aan ons retourneren in de bijgevoegde enveloppe?
Deze enveloppe is geadresseerd aan het antwoordnummer van AGB Quantron en kunt u ongefrankeerd verzenden.
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Als tegenprestatie, ter waarde van ƒ 50,-- willen wij u graag de keuze bieden uit:

- een boekenbon;
- een platen/CD-bon;
- een VVV-bon;
- een donatie uit uw naam aan een door u te bepalen goed doel.

Op de laatste pagina van de vragenlijst kunt u uw voorkeur aan ons kenbaar maken.

Anonymity of Informants

Article 2
Subject only to the provisions of Article 3, the Informant shall remain entirely anonymous. Special care must be taken to ensure that any record which contains a reference to the identity of an Informant is securely and confidentially stored during any period before such reference is separated from that record and/or destroyed. No information which could be used to identify Informants, either directly or indirectly, shall be revealed other than to research personnel within the Researcher's own organisation who require this knowledge for the administration and checking of interviews, data processing, etc. Such persons must explicitly agree to make no other use of such knowledge. All Informants are entitled to be given full assurance on this point.

Article 3
The only exceptions to the above Article 2 are as follows:

a) If Informants have been told of the identity of the Client and the general purposes for which their names would be disclosed and have then consented in writing to this disclosure.

b) Where disclosure of these names to a third party (e.g. a subcontractor) is essential for any purpose such as data processing or in order to conduct a further interview with the same Informant (see also Article 4). In all such cases the Researcher responsible for the original survey must ensure that any third parties so involved agree to observe the provisions laid down in this Code.

c) Where the Informant is supplying information not in his role as a private individual but as an employee, officer or owner of an organisation or firm, provided that the provisions of Article 5 are followed.

Article 4
Further interviews, after the first, shall only be sought with the same Informants under one of the following conditions:

a) in the course of carrying out normal quality control procedures, *or*

b) if Informants' permission has been obtained at a previous interview, *or*

c) if it is pointed out to Informants that this interview is consequent upon one they have previously given and they then give their permission before the collection of further data, *or*

d) if it is essential to the research technique involved that Informants do not realise that this interview is consequent upon one they have previously given, but they do give their permission before the collection of further data.

Article 5
If the Informant is supplying information not in his role as a private individual but as an employee, officer or owner of an organisation or firm, then it may desirable to list

DANKWOORD/ACKNOWLEDGEMENTS

Nu het proefschrift af is wil ik velen bedanken voor hun hulp bij de totstandkoming ervan. Allereerst wil ik mijn twee promotoren bedanken. Professor dr. J.G.A.J. Hautvast, beste Jo, hartelijk dank voor je enthousiasme, inzet en steun. Het is een waar genoegen met jou samen te werken. Professor dr. C.M.J. van Woerkum, beste Cees, jij zorgde voor de voorlichtingskundige sturing van het onderzoek en ook van jou heb ik veel geleerd. Hartelijk dank voor alles wat je voor het onderzoek deed.

Dan kom ik nu bij de twee leden van mijn begeleidingsgroep, die ook als mede-auteurs van de artikelen optreden: Dr. C.J. Fieren en dr. M.A. van 't Hof. Dr. Fieren, beste Carel, jouw inbreng als enthousiast en gedreven huisarts met wetenschappelijke belangstelling was van onschatbare waarde. Dr. van 't Hof, beste Martin, hartelijk dank voor je post-doctorale cursus Biometrie en voor het samen analyseren. Alleen was ik er niet op deze manier én niet op deze termijn uitgekomen.

Hoe kun je nu onderzoek doen, nog wel met inschakeling van een professioneel marktonderzoekbureau, en een proefschrift schrijven terwijl je een full-time baan hebt? Wel, dat is mogelijk als je werkt bij de Stichting Zuivel, Voeding & Gezondheid met als directeur drs. W. Visser. Hij verschafte mij de mogelijkheden, waaronder één dag per week vrijgesteld zijn voor het onderzoek en financiële ondersteuning van het onderzoek door de Stichting Zuivel, Voeding & Gezondheid. Beste Wiebe, graag zeg ik jou en het Bestuur van onze Stichting hartelijk dank voor het in mij gestelde vertrouwen. Het Bestuur dank ik ook voor de mij geboden materiële mogelijkheden.

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In verschillende fasen van het onderzoek hebben stagiaires hun beste krachten gegeven aan deelaspecten van het onderzoek. Graag wil ik met ere noemen de doctoraal studenten Humane Voeding en Voorlichtingskunde, Margit Mulder, Jacqueline Bos, Judith Goud-Hassink en Lidewij Henneman, en Patricia Siereveld (studente Diëtetiek Groningen). Ook de discussies over het onderzoek met Barbara Mutsaers (de allereerste stagiaire bij de Stichting ZVG) heb ik ten zeerste gewaardeerd.

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Wat stelt een schriftelijk onderzoek voor zonder een goede respons? De huisartsen die de moeite hebben genomen de enquête in te vullen (gemiddelde duur $\pm$ 40 minuten) wil ik graag hartelijk danken voor hun inspanning. Ook zij die meededen aan het kwalitatieve onderzoek, de pretesten en de pilotstudie wil ik hierbij hartelijk bedanken.

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Het plan werd opgevat om in december 1995 een internationale workshop te organiseren over 'Nutritional attitudes and practices of primary-care physicians' teneinde de resultaten van ons onderzoek te evalueren en in een wereldwijd perspectief te bediscussiëren. Wij, - mijn promotoren en ondergetekende - vonden een aantal mensen onmiddellijk bereid deel te nemen in het werk van de Wetenschappelijke Commissie: Prof.dr. Chris van Weel, huisarts- en verpleeghuisartsgeneeskunde, van de Katholieke Universiteit Nijmegen, dr. Carel J. Fieren, huisarts te Wageningen, prof. dr. Stewart Truswell, Boden Professor of Human Nutrition, Sydney, Australië en dr. Ton Drenthen, staflid preventie van het Nederlands Huisartsen Genootschap (NHG). Jullie bijdrage heeft mede geleid tot een door alle deelnemers als succesvol ervaren workshop en graag zeg ik jullie daarvoor hartelijk dank. Hier is ook een dankwoord op zijn plaats voor de verkregen financiële ondersteuning van de Stichting Zuivel, Voeding & Gezondheid.

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Fred Ros van Fred Ros Art Direction Amsterdam (vormgever van het VoedingsMagazine)

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Gert Jan Hiddink

Amerongen, april 1996

CURRICULUM VITAE

Gerrit Jan Hiddink werd geboren op 23 juli 1951 te Zelhem. Van 1963 tot 1968 volgde hij zijn middelbare school opleiding (HBS-B) aan het Bandartius College te Zutphen. In augustus 1968 begon hij met de studie Humane Voeding aan de toenmalige Landbouwhogeschool te Wageningen. In januari 1975 studeerde hij af als landbouwkundig ingenieur in de richting Humane Voeding met als hoofdvakken Humane Voeding en Toxicologie en Biochemie als bijvak. Van maart 1975 tot september 1989 werkte hij bij Het Nederlands Zuivelbureau te Rijswijk als verantwoordelijke voor de voedingsvoorlichting aan kadergroeperingen. Vanaf 1 september 1989 is hij in dienst van de Stichting Zuivel, Voeding & Gezondheid (ZVG) te Maarssen, als Manager Research verantwoordelijk voor het voedings-onderzoeksprogramma van de Stichting en voor de voedingsvoorlichting aan kadergroeperingen.

In september 1988 werd het certificaat behaald van het 'Privatissimum Public Relations en Voorlichting' van de Vereniging voor Public Relations en Voorlichting (NGPR).

Het in dit proefschrift beschreven onderzoek startte in september 1990 en werd bewerkt aan de Vakgroep Humane Voeding -in samenwerking met de Vakgroep Voorlichtingskunde- van de Landbouwuniversiteit te Wageningen. In juni 1993 werd een post-doctorale cursus Biometrie aan de Katholieke Universiteit van Nijmegen, onder leiding van Dr. M.A. van 't Hof, met goed gevolg afgesloten. Hij fungeerde als secretaris van zowel de Wetenschappelijke Commissie als de Organisatie Commissie van de 'International Workshop on nutritional attitudes and practices of primary-care physicians' dat van 11-13 december 1995 plaatsvond in Heelsum, Nederland.

Hij treedt elk jaar op als organisator en voorzitter van een internationale workshop over een voedingsonderzoeksthema, georganiseerd onder de paraplu van de internationale 'Utrecht Groep', bestaande uit 14 nationale organisaties, vergelijkbaar met ZVG.

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