

**Lifestyle counseling by physicians and
practice nurses in primary care**
An analysis of daily practice

Janneke Noordman

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**Lifestyle counseling by physicians and
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1

Introduction

“Asking, listening, and informing are the communication equivalent of technical proficiency in music; the more proficient, the wider the range of application, skilfulness, and enjoyment”. (Rollnick, Miller and Butler 2008, p 19)

This quote by Rollnick, Miller and Butler [1] illustrates that asking, listening and informing are fundamental communication skills. Healthcare providers are constantly using these techniques during their consultations. The more skilled the providers are in performing these communication techniques the more effective and (time) efficient the consultation is likely to be for both providers and patients.

The study described in this thesis focuses on the communication skills of general practitioners (GPs) and practice nurses (PNs). The aim is to obtain insight into their performance of lifestyle counselling during routine primary care consultation, targeting the patient’s behavioural change in smoking, alcohol use, physical activity and dietary habits. This first chapter addresses the necessity for improved lifestyle counselling in primary care, and presents the theoretical background and framework for this study. Furthermore, the aim of the study, research questions and design are presented. Finally, the structure of this thesis is outlined.

Background

There is a worldwide epidemic of chronic diseases, due to a combination of an increasingly aging population, unhealthy lifestyle behaviour and medical ‘cures’ to previously fatal diseases [2,3]. In the European Union, an average of 28% of the men and 33% of the women are diagnosed with a chronic disease [4]. This is comparable with the percentages of chronically ill people in The Netherlands: about 4.5 million (28% of the population), of which one third has multiple chronic diseases, with people above the age of 65 and women more often being diagnosed with a chronic disease [5]. The global burden of (multiple) chronic diseases has resulted in an increasing demand on (prolonged and complex) healthcare resulting consequently in rising healthcare costs. The number of chronically ill people is expected to increase even more during the coming decades [6].

The World Health Organization offers a glimmer of hope in this gloomy scenario by proclaiming that 80% of premature heart disease, stroke and diabetes can be prevented [7]. Smoking, poor nutrition, alcohol abuse and physical inactivity are related to chronic diseases like heart and vascular disease, diabetes mellitus type 2, Chronic Obstructive Pulmonary Disease

(COPD) and certain cancers [8,9]. Each year about 40.000 people in the Netherlands are diagnosed with diabetes type 2, heart and vascular disease and cancer due to their unhealthy diet [10]. Furthermore, smoking is responsible for 80 to 90% of COPD and lung cancer diagnoses [11], and inactivity is considered the fourth cause of death worldwide [12]. Changes in lifestyle, such as increased exercise, improved diet, lower alcohol consumption and not-smoking can therefore improve overall health [13] and subjective well-being [14].

The global burden of chronic diseases and the crucial central role of healthy lifestyle behaviour require both preventive and management strategies [9], i.e. inhibiting the development of disease before symptoms start to occur, as well as minimizing the consequences of the disease. Previous studies have found significant outcomes due to lifestyle interventions in primary care, e.g. in obese patients [15], patients with coronary heart disease [16], patients with hypertension [17], patients at risk for diabetes type 2 [18], in sedentary older patients [19], binge drinkers [20] and for smoking cessation [21]. Community-based lifestyle interventions demonstrate similar, cost-effective, outcomes [18]. However, previous studies also suggest a low willingness to participate in prevention programmes [22,23]. Effects of prevention are often only visible after a long time, and even then effects can remain unclear. Furthermore, adherence to lifestyle interventions seems low [24,25]. There are only few studies which have examined the willingness to participate in lifestyle interventions and even fewer have looked at adherence [22]. Additionally, there is little evidence that advising overweight patients to decrease their weight by reducing their food intake or to practice regular daily physical activity has any measurable benefit [26].

There is an ongoing debate within science and policy concerning promising approaches to health behaviour and behaviour change: prioritizing environmental (external) elements of behaviour change (i.e. a sociological or ecological approach) or focusing on intrapersonal (internal) elements of behaviour change (i.e. a psychological approach).

The environmental approach distinguishes between four types of determinants: the physical (what is available), socio-cultural (what are the attitudes and beliefs), economic (what are the costs) and political (what are the rules and laws) environment. The four types of environmental determinants are roughly positioned on three different levels: micro, meso or macro level. The micro level, also called 'behavioural setting', refers to the immediate living or working environment. The meso level, also called 'the

context', concerns family and neighbourhood, and the macro level refers to the broad (healthcare) system [27,28]. There are many examples of taking the environmental approach to disentangle the problem of unhealthy behaviour. For example, since 2011 sixteen countries have banned or restricted smoking in public and work places [29]. The UK, Ireland and Turkey prohibit smoking in all public areas with no exceptions (including work places, bars and restaurants). The Netherlands banned smoking in 2008, but decided in 2010 that bars smaller than 70 square meters or solo businesses without employees are excluded from this law. As a result, one can smoke again in about half of the Dutch bars and venues. This year the amount of smokers in The Netherlands has increased for the first time since 2011 [30]. Other examples of this approach in The Netherlands are: the reimbursement of quit smoking programs and nicotine replacement [31,32], municipalities who receive financial support for implementing interventions to stimulate physical activity in the population [33], promoting a healthy diet through mass media strategies [34], a healthcare insurer where insured people with a healthy lifestyle (also chronically ill people) save for discount and healthcare products [35], and the recent policy plan to lower the amount of salt in bread [36].

In contrast to this environmental approach is the intrapersonal perspective towards behaviour change by which policy makers stress that people make their own decisions concerning their health and advocate the patient's own responsibility and self-management [37,38]. This intrapersonal approach focuses on personal determinants to explain health behaviour and behaviour change. The following personal determinants are seen as important [28]: a person's behavioural intention ('I want to stop smoking'), their attitude or beliefs towards the behaviour ('eating so much salt is not good for my health') [39], perceived norms and perceived social influence (consisting of normative beliefs, motivation to comply, social support and modelling: 'my daughter expects me to stop smoking') [39], self-efficacy [40] ('I expect that I can exercise two times a week'), anticipated regret and moral obligation [41], risk perception [42], knowledge and awareness about health, disease and risk behaviour [43], and personality traits [44].

In general the entire population can be reached relatively easily through environmental strategies. However, this approach does not take into account important determinants such as the needs and motivation of the individual patient and the support for self-management. Focussing on behaviour change and self-management can benefit people's attitude, behaviour,

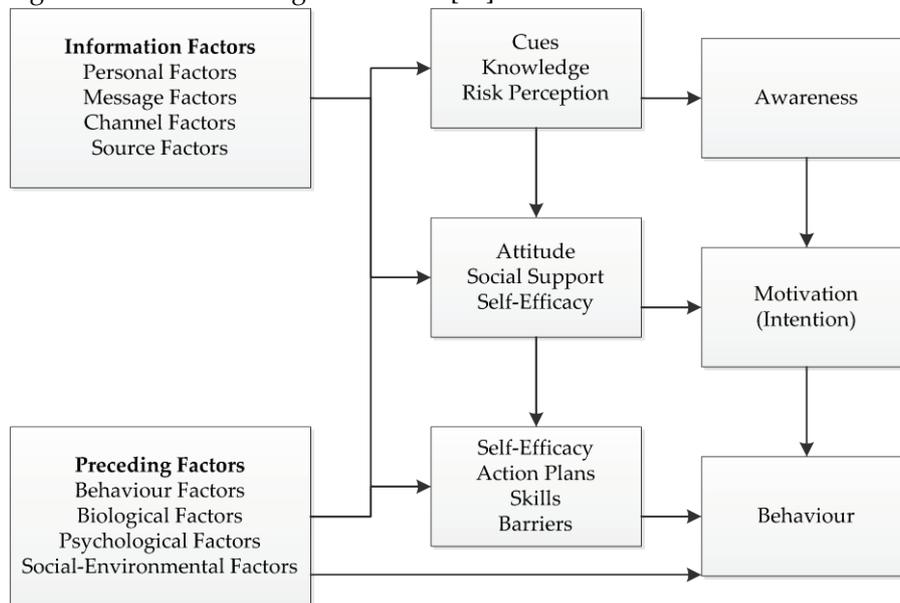
quality of life, clinical symptoms and use of healthcare resources [45]. According to the International Health Policy Survey (2012), of general practitioners (GPs) in several Western countries, Dutch GPs do not spend much time on guiding patients towards behaviour change and supporting self-management. In contrast to other countries, Dutch GPs do have substantial numbers of patients, but spend relatively little time on interacting with them [46]. Furthermore, the presence of practice nurses, who work alongside GPs, appears to be related to the provision of lifestyle management instructions [47]. Therefore, investing in lifestyle counselling in primary care is likely to lead to improved health for patients and more affordable healthcare in general [45,46].

Theoretical framework

The Integrated Model for Change (I-Change (2.0) model) (see Figure 1.1) is a theoretical model to study and facilitate behaviour change, that focuses on intrapersonal determinants, without ignoring environmental factors [48,49]. The I-Change model integrates determinants of several theories, such as 'self-efficacy' from Bandura's Social Learning Theory [40], 'attitude, intention and social influences' from the Theory of Planned Behaviour [50], 'cues to action, risk perception and barriers' from the Health Belief Model [51] and the motivational phases from the Transtheoretical Model or Stages of Change Model [52], among others. At the heart of the I-Change model is the Attitude – Social influence – Self-efficacy (ASE) model [53], which is fairly similar to the Theory of Planned Behaviour [50], though it includes modelling and social support as social influences. According to the I-Change model the process of behaviour change consist of three phases: awareness, motivation and action. In the awareness (pre-motivational) phase people should become aware of their risk behaviour. To proceed to the motivational phase, knowledge, risk perception and cues to action are of importance. In the motivational or intentional phase, important factors are attitude, social support and self-efficacy. When people are motivated to change their behaviour, intentions then need to be translated into actual behavioural change. Therefore, people should make a plan of action to overcome barriers to the behaviour change [54]. Factors that influence a person's motivation according to the I-Change model are behaviour factors (e.g. lifestyles), psychological factors (e.g. personality), biological factors (e.g. gender, genetic predisposition), social and cultural factors (e.g. policies) and information factors (quality of the message, channels and sources used) [48].

This model has previously been used successfully as a theoretical starting point (and for predicting and explaining health behaviours) in several studies in the field of behaviour change, from smoking behaviour to cardiovascular disease [54, 55, among others].

Figure 1.1 The I-Change Model 2.0 [49]



This thesis focuses on the three phases of the I-Change model (awareness, motivation and behaviour) by examining the following 'lifestyle counselling' techniques: Motivational Interviewing (raising awareness, increasing intrinsic motivation, guiding towards behaviour change, overcoming barriers and action planning), within the Stages of Change (raising success rates by tailoring to different motivational phases of behaviour change), and tailoring information and advice to individual patients (raising success by tailoring to personal and social-environmental factors). Healthcare providers performing these counselling techniques (within the patient's stage of change) are guiding patients towards behaviour change, from awareness to action and maintenance of behaviour, representing the three phases of the I-Change model. Recent studies also used Motivational Interviewing, Stages of Change and tailoring techniques within the I-Change model [54, 56-58]. However, these studies consist of web-based, printed material or telephone interventions. Although Broekhuizen and colleagues did include face-to-face

sessions, these were delivered by a lifestyle coach with low Motivational Interviewing fidelity [56]. In this thesis, Motivational Interviewing techniques and tailoring of information and advice will be assessed by examining the face-to-face behaviour of primary care providers during routine consultations (as 'channel/source'). The Stages of Changes will be coded by observing the actual communication between primary care providers and patients during routine consultations, i.e. by assessing patient's intention to change their behaviour. These techniques cannot be used in isolation and are therefore imbedded in a broader communication context; i.e. performing lifestyle counselling presumes a basic set of (medical) communication skills (e.g. exploration, summarizations, structuring, showing empathy) and clinical competences (i.e. adhering to guidelines).

The primary health care setting offers a great opportunity to examine the intrapersonal perspective (according to the I-change model) within the context of a long lasting relationship between provider and patient, and the knowledge of the patient's context.

The context of primary care in which lifestyle counselling is performed and the techniques examined in this thesis, are subsequently described in more detail.

Primary health care

Primary health care is the most relevant setting to address behavioural risk factors [59-61], since the majority of people visit the physician or general practitioner (GP) at least once a year [62,63] and behaviour change requires regular healthcare contacts [61]. Nowadays most GPs (84%) and patients (78%), think that it is within GP's task description to provide (unsolicited) advice to patients about their lifestyle behaviour [64]. However previous research shows that patient's lifestyle behaviour is discussed in only a minority of GP consultations [65,66].

In the United Kingdom, GPs have had a contract since 1990 to promote health. This has encouraged a new structuring of general practice, with practice nurses (PNs) and nurse practitioners (NPs) working alongside GPs [67]. One of the reasons for adopting this structure are the increasing demands on health care and especially on the workload of GPs [68]. In Sweden, Finland, Australia, New Zealand and The Netherlands, this collaborative system has also been implemented [69,70]. This enables GPs to delegate tasks to primary care nurses, regarding patients with chronic

illnesses and their lifestyle [68,71,72]. Generally GPs diagnose and initiate treatments and lifestyle counselling, whereas practice nurses (or nurse practitioners) monitor treatment outcome, provide education and support for behaviour change, and offer follow-up contacts [73,74].

The context of Dutch primary care

GPs play a fundamental role in the Dutch healthcare system as 'gatekeepers'. According to the gatekeeper system, access to specialists and hospital care requires a referral from a GP. Furthermore, every Dutch patient has a fixed GP [75], which enables GPs to build and maintain personal relationships with their patients so that they are aware of patients' social context and their life events. In the Netherlands, 9881 GPs are employed of which 7866 have their own practice [76]. 75% of the adult population visits the GP at least once a year [77].

PNs were first introduced in to Dutch general practice around 1999 to (1) reduce the workload of GPs as a result of the rising demand for care (task delegation), (2) to improve the quality of care for chronically ill people and, (3) to stimulate the cooperation between GPs, i.e. a total of 4500 patients is a requirement for employing a PN [47,68]. PNs work under supervision of GPs, which means that PNs can not refer patients or prescribe medicines without permission of a GP. PNs manage consultations independently, similar to GPs. Both GPs and PNs follow clinical practice guidelines (Dutch College of General Practitioners (DCGP) standards) during their encounters with patients, in for example diabetes type 2, cardiovascular disease prevention and the stop smoking guideline [78]. Parallel to these guidelines, multidisciplinary healthcare standards ('zorgstandaarden' and 'zorgmodules') are (being) developed for healthcare providers and chronically ill patients, although these are only being used so far to a small extent [3]. The DCGP standards and healthcare standards cover mainly the same topics, although the healthcare standards are multidisciplinary in nature.

Previous research shows that the contribution of PNs does not directly result in a reduced workload for the GPs, as was initially intended by PNs' introduction [68,79]. PNs' involvement does lead to improved care and access to care for chronically ill patients, especially for patients with diabetes type 2 [47,71,80].

In 2004 a 'competence profile' was developed for PNs, in which their professional competences are described. According to this profile PNs

should provide care to patients with chronic diseases in general practice, with specific focus on patients with diabetes type 2, asthma, COPD and patients at risk for cardiovascular diseases. Other competences that are described in this profile are: providing education, collaboration with patients and other professionals, practice management, quality of care and professional development. In 2010 the competence profile was extended to include two new competences: care for the elderly and prevention [81]. In 2011 there were between 3700 and 4700 PNs are working within 3482 general practices in the Netherlands. Dutch patients with chronic diseases visit the PN more often than the GP (from 2% in 2003 to 39% in 2008), while the total number of general practice visits remains stable [82].

Medical communication and lifestyle counselling

Adequate communication between patients and primary care providers is essential for good clinical practice and it can (indirectly) result in improved health outcomes in patients [83-85]. Patients have the 'need to know and understand' (cognitive need) and the 'need to feel known and understood' (affective need) [86-88]. The patient's needs have consequences for the communication between the primary care provider and the patient. The cognitive need of patients asks for task-oriented communication, e.g. giving information, structuring the consultation. Patient's affective need suggests supportive, affective communication from the healthcare provider, e.g. showing empathy, exploration of expectations and feelings, dealing with emotions [87,89]. A widely used instrument to assess the communication skills of primary care providers (i.e. physicians), which reflects this two-dimensional structure of affect-oriented and task-oriented skills [89], is the MAAS-global [90].

Satisfying patients' cognitive and affective needs presupposes a patient-centred communication style, known for its positive impact on health and other patient outcomes [91-95]. A patient-centred approach appears more effective than solely providing information (e.g. presenting general health risks) and direct advice [96,97]. A patient-centred provider communicates with the patient about his or her perception of the disease and related action, explores the needs, expectations and preferences of the patient in an optimal way and stimulates the patient to actively participate in healthcare decisions [94,98]. The relationship between provider and patient is seen as a partnership rather than an expert-recipient one. In this approach the patient is seen as a unique person and communication is adapted to the individual

[94,95]. Therefore, primary care providers who perform lifestyle counselling should preferably 'tailor' their information and advice to a patient, by adapting information and advice to individual characteristics related to outcomes of interest [97,99]. Tailored interactions are acknowledged to be more relevant than generic communication for health behaviour change, in helping patients to become and continue to be motivated, obtain new skills and perform and maintain desired lifestyle changes [97,99].

Motivational Interviewing

Motivational Interviewing (MI) is a promising patient-centred approach to behaviour change. MI focuses on increasing intrinsic motivation to behaviour change by helping patients explore and resolve ambivalence between desired behaviour and actual behaviour [100,101]. It is seen as the patient's task to express and resolve this ambivalence, whereas the healthcare provider expects and recognises ambivalence and guides the patients in examining and resolving it (elicit and support 'change talk') [102]. MI is both a counselling style and a set of techniques [96]. The four basic principles of MI are: expressing empathy, developing discrepancy, rolling with resistance and supporting self-efficacy [101,103]. Expressing empathy is central to MI, which includes reflective listening, an attitude of acceptance, and the belief that patient's ambivalence is normal. MI facilitates behaviour change instead of arguing about. Direct persuasion is seen as opposite to MI and counterproductive. Resistance may be looked upon as a prerequisite for change strategy, which should be acknowledged and explored [101,102]. Furthermore, the patient is seen as skilled in finding solutions to his/her own problems of behaviour change. Healthcare providers should therefore support patient's self-efficacy, i.e. stimulate patients' belief in their ability to change and support the chosen strategy and process to change. Therefore, the main interview techniques of MI are: showing empathy, asking open-ended questions, affirmation, reflective listening and summarizing [101].

MI derives from Miller's experience with the treatment of problem drinkers [104], and was elaborated on by Miller and Rollnick [103]. It is currently used in various settings for a range of health behaviours [96,100,105,106]. Several studies have shown that MI has led to positive psychological, physiological and lifestyle change outcomes, and is particularly appropriate in the management of chronic illness [96, 105,106]. However, other

behaviour change techniques, for example, prescriptive advice, goal-setting and self-monitoring, also show similar positive health outcomes [107,108]. On the whole, MI provides a means for healthcare providers to effectively communicate with patients about health behaviour and behaviour change. The techniques do however require extensive time to execute (on average 40 to 60 minutes). 'Brief motivational interviewing' (or so-called 'behaviour change counselling') selects crucial elements of MI (i.e. demonstrating respect for patient choice, asking open questions, using empathic listening and summarizing, among others) to use in clinical practice, where brief contact times with patients are common [101,109]. A brief MI intervention would usually last between five and thirty minutes [101,110].

Stages of Change concept

A patient's motivation to change (or maintain) healthy behaviour may vary over time and from one situation to another [102,111]. Combining MI with the stages of change (SOC) construct from Prochaska & DiClemente's Transtheoretical Model (TTM) is therefore seen as a potentially useful strategy to help patients change their behaviour [111-114]. SOC and MI are complementary clinical theoretical frameworks: the stages of change reflect the clinical role of MI, while MI offers counselling techniques to help people progress along the stages in order to change their behaviour [111,112]. According to SOC, individuals are at different stages of motivational readiness for engaging in health behaviours, and intervention methods (i.e. interpersonal communication) are most useful when they are tailored to a person's current stage of motivational readiness. The core organizing principle of the TTM is the SOC construct, which represents a temporal dimension and distinguishes five stages of change indicating individuals' predispositions to change: precontemplation (no intention to change behaviour within the next 6 months), contemplation (intention to change behaviour within the next 6 months, but does not act on intention to change behaviour), preparation (intention to change behaviour within 30 days), action (people changed from unhealthy to healthy behaviour within the past 6 months), and maintenance (maintenance of the behaviour change for more than 6 months) [52,113,115-117]. Progression between the stages of change is not linear and patients may move forward and backward. Individuals in the various stages of change differ with respect to stimuli and barriers they experience during the process of health behaviour change. In other words, the factors and processes hindering or facilitating behaviour change are

assumed to differ in each specific stage of change. Patients are therefore assumed to benefit most if healthcare providers adapt (tailor) their communication to the individual's stage of change [113,115, 118]. However, there are studies that indicate that the TTM model or SOC construct are not beneficial in changing behaviour, since boundaries between stages are arbitrary, they focus on conscious decision making and planning processes, most people do not clearly formulate their intentions and readiness is not actually assessed [119-121]. Combining SOC and MI may overcome (some of) these limitations, because MI offers clear techniques to guide patients towards behaviour change in accordance with their current stage of change, thereby helping patients to formulate their intentions and breach routine or unconscious processes of behaviour.

Room for improvement in lifestyle counselling in primary care

Even though the community added value of primary care preventive and management activities is generally accepted and broadly advocated, the quality of the actual delivery process during healthcare visits is usually taken for granted, and implementation checks are scarce.

This thesis provides insight into primary care providers' performance of lifestyle counselling during routine consultations. Initially, a literature study was conducted. There is limited understanding of which communication-related behaviour change techniques (BCTs) are effective, when used in face-to-face lifestyle interventions in primary care. Earlier studies have shown a wide range of possible BCTs, used in various settings, with limited effects [122]. Furthermore, it is unknown which primary care provider, GP or nurse, is more effective in using face-to-face communication-related BCTs. Previous studies demonstrate that GPs and nurses differ in their approach to patients and disease management: nurses spend more time on counselling patients than GPs and during the education and training of nurses there is more emphasis on patient education, lifestyle and disease prevention [123,124]. GPs on the other hand, may traditionally be considered to have more authority to deliver care to patients.

Secondly, to be able to improve lifestyle counselling in primary care it is necessary to get a peak into what actually takes place in the consulting room. Previous studies have relied on professionals' and patients' evaluations of lifestyle communication in consultations, which often does not result in reliable results about the actual communication [125,126].

Therefore, in this thesis real-life video-recorded encounters between primary care providers and patients were observed.

Thirdly, continuing medical education (CME) may be necessary to improve lifestyle counselling in primary care. Video-feedback, based on video-recorded real-life patient encounters, seems a promising method for CME [127]. A recent meta-analysis showed that video-feedback had a significant effect on the key communication skills of several different professionals [128], and may be especially valuable for health counselling [129]. Consequently, we developed a video-feedback method. In this thesis, the feasibility and acceptability of video-feedback as a method to reflect on communication skills of primary care providers was examined. Finally, the effects of video-feedback on the communication skills, clinical competence and motivational interviewing skills of practice nurses were investigated.

The current study

Aim

The overall aim of this study is to gain insight into general practitioners' (GPs) and practice nurses' (PNs) performance of lifestyle counselling during routine primary care consultations, targeting the patient's behavioural change in smoking, alcohol use, physical activity and dietary habits.

Research questions

This thesis is divided in three sections: (1) literature study (research question 1), (2) observational studies (research question 2) and (3) feedback studies (research question 3).

The following research questions have been addressed:

- 1a. What is known in the literature about effective face-to-face communication-related behaviour change techniques (BCTs) used in interventions in patients' lifestyle behaviour, i.e. smoking, alcohol, nutrition, weight and physical activity?
- 1b. What is known in the literature about which primary care provider, GP or nurse, is more effective in using face-to-face communication-related BCTs?
2. How do GPs and PNs perform lifestyle counselling and apply motivational interviewing in routine primary care consultations?
- 3a. Is video-feedback a feasible and acceptable method to reflect on communication skills according to GPs?
- 3b. What is the effect of video-feedback on the communication skills, clinical competence and motivational interviewing skills of PNs?

Data collection

Video-recordings were made of GP-patient and PN-patient consultations as part of: (1) the NIVEL GP-patient communication study in 2007-2008 and (2) the NIVEL PN-patient communication study in 2010-2011. The separate studies are described below.

GP-patient communication study

GPs participating in this study are all members of the Netherlands Information Network of General Practice (LINH), a representative network of 84 general practices and more than 330000 patients [77]. A sample of 93 GPs was drawn from LINH of which 40 GPs (44%) from 20 practices agreed

to participate in the video observation study. These 40 GPs represent the Dutch GP regarding gender and practice form (single, duo, group practice or healthcare centre), but were on average 4 years older than the average Dutch GP. The GPs agreed to have approximately twenty consecutive, everyday consultations videotaped. The recording with an unmanned digital camera took place on one or two random days, resulting in a total of 808 recorded consultations of 808 patients and 40 GPs. 77.6% of the patients agreed to participate. Non-responders were somewhat older (on average 48 years versus 43 year) and less often female. All GPs were offered video-feedback on their communication skills. The feasibility and acceptability of the video-feedback was examined.

PN-patient communication study

The participating GPs from study (1), and GPs from one other practice, were contacted for participation of their PNs in study (2); ten PNs from seven practices agreed to participate (47% of the GP practices responded; six practices did not employ a PN). Additionally, another health care centre contacted us for participation of their ten PNs. This resulted in 20 PNs, of which one stopped working during our study and has therefore been omitted. So that 19 PNs participated in total. The 19 PNs agreed to have approximately ten consecutive, everyday consultations videotaped during one or two random days at T0, resulting in 181 recorded consultations. At T1 (three to six months later) 18 of the 19 PNs agreed to have approximately ten consecutive, everyday consultations videotaped again during one or two random days, resulting in 169 recorded consultations. 90% of the patients agreed to participate. Non-responders did not differ from responders regarding gender.

All PNs were offered video-feedback on their communication skills, clinical competence and motivational interviewing skills. The effects of the video-feedback on PNs' skills were measured in a pre-test/post-test control group design. Before the recording of the consultations, PNs were allocated to a control or an experimental group. PNs allocated to the experimental group received video-feedback between T0 (pre-measurement) and T1 (post-measurement), T1 taking place between one to two months after the video-feedback. PNs in the control group received video-feedback after T1.

For the purpose of analysis several selections within the study populations were made. These selections are described in each separate chapter.

Outline of this thesis

This thesis is divided into three sections: (1) literature study (chapter 2), (2) observational studies (chapter 3-6) and (3) feedback studies (chapter 7 and 8).

The first section, chapter 2, describes a systematic literature review regarding effective face-to-face communication-related behaviour change techniques (BCTs) used in interventions to intervene on patient's lifestyle behaviour. It also focuses on which primary care provider (GP or nurse) is more effective in using face-to-face communication-related BCTs, according to the literature.

The second section, chapter 3 to 6, reports on cross-sectional observational studies concerning lifestyle counselling by GPs and PNs.

In chapter 3 the frequency of discussing patient's lifestyle behaviour during GPs' consultations are presented, between 1975 and 2008. Furthermore, GP's approach to lifestyle behaviour was examined and patient characteristics were taken into account. Chapter 4 explores lifestyle counselling in routine primary care consultations. In this study, the extent to which GPs and PNs provide generic or tailored information and advice, and use motivational interviewing, are described. Chapter 5 discusses PNs' application of motivational interviewing techniques in routine primary and secondary prevention consultations. In Chapter 6 PN's application of motivational interviewing, generic communication and clinical competence within patient's different Stages of Change is described.

The third section describes the feedback studies. Chapter 7 reports on the method of web-enabled video-feedback developed to evaluate and improve GPs' communication skills. Chapter 8, the effects of video-feedback on PNs' generic communication skills, clinical competence and motivational interviewing skills are evaluated, in a pre-test/post-test control group design.

Finally, the results of the study are summarised and discussed in view of earlier findings, theory and methods. In addition, implications for practice and further research are formulated.

This thesis is based on seven articles about the studies performed. Overlap across chapters is inevitable since every chapter was written to be read as a stand-alone article in its own right.

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2

Communication-related behavior change techniques used in face-to-face lifestyle interventions in primary care: a systematic review of the literature

Noordman J, van der Weijden T, van Dulmen S. Communication-related behavior change techniques used in face-to-face lifestyle interventions in primary care: a systematic review of the literature. *Patient Education and Counseling* 2012; 89:227-244.

Abstract

Objectives

To systematically review the literature on the relative effectiveness of face-to-face communication-related behavior change techniques (BCTs) provided in primary care by either physicians or nurses to intervene on patients' lifestyle behavior.

Methods

PubMed, EMBASE, PsychINFO, CINAHL and The Cochrane Library were searched for studies published before October 2010. Fifty studies were included and assessed on methodological quality.

Results

Twenty-eight studies reported significantly favorable health outcomes following communication-related BCTs. In these studies, 'behavioral counseling' was most frequently used (15 times), followed by motivational interviewing (eight times), education and advice (both seven times). Physicians and nurses seem equally capable of providing face-to-face communication-related BCTs in primary care.

Conclusion

Behavioral counseling, motivational interviewing, education and advice all seem effective communication-related BCTs. However, these BCTs were also found in less successful studies. Furthermore, based on existing literature, one primary care profession does not seem better equipped than the other to provide face-to-face communication-related BCTs.

Practice implications

There is evidence that behavioral counseling, motivational interviewing, education and advice can be used as effective communication-related BCTs by physicians and nurses. However, further research is needed to examine the underlying working mechanisms of communication-related BCTs, and whether they meet the requirements of patients and primary care providers.

Introduction

Patients' lifestyle behavior is significant for their physical and mental health. A healthy lifestyle (e.g. non smoking, minimal alcohol use, healthy diet and being physically active) can prevent or reduce the burden of chronic diseases such as type 2 diabetes, cardiovascular diseases, kidney diseases and Chronic Obstructive Pulmonary Disease (COPD) [1-3]. Regardless of the growing evidence of these preventive and therapeutic effects, the prevalence of unhealthy lifestyle behaviors remains high. In the USA and many European countries the number of obese or overweight patients even increased in recent years [4] and tobacco dependency and alcohol misuse continue to be major problems [5]. The high prevalence of unhealthy behaviors and chronic diseases has led to increased attention for a healthy lifestyle by governments around the world [6,7]. In the Netherlands for example, there is a renewed attention for the prevention of chronic diseases as stated in the prevention bill, aimed at reducing the incidence of smoking, alcohol abuse, obesity, type 2 diabetes and depression [8,9], by offering counseling to high risk patients in primary care.

A general practitioner (GP) is the primary provider for patients at risk of developing lifestyle-related chronic illnesses. Interventions aimed at changing unhealthy lifestyles should therefore primarily take place in general practice [10]. In the UK, GPs have a contract since 1990 to promote health, which has encouraged a new structure of general practice, with practice nurses (PN) and nurse practitioners (NP) working alongside GPs [11]. Within the Dutch general practice this collaborative system is also common since 1999 [12]. This enables GPs in the UK, the Netherlands and other Western countries to delegate tasks, regarding patients with chronic diseases and their lifestyle, to practice nurses and nurse practitioners or assistants [12,13]. Nowadays, a PN is employed in about 80 percent of the general practices in the Netherlands [14]. Dutch patients with chronic diseases visit the PN more often than the GP (from 2% in 2003 to 39% in 2008), while the total number of general practice visits remains stable [15]. Yet, changing lifestyle behavior is difficult and requires effort, time and motivation from both health care provider and patient. Besides, patients are often ambivalent about behavior change [16,17]. Providing advice about behavior change to patients is a common approach used by health care providers, although previous studies show that the effectiveness of advice giving is uncertain [16,18]. Insight into effective behavior change techniques

(BCTs) can help health care providers in primary care to contribute to a better lifestyle and improved health for patients and eventually reduce health care costs [17,19]. Michie and colleagues [20] listed 137 BCTs that are used by health care providers in daily practice or can be used as an intervention to change behavior, such as goal setting, screening and motivational interviewing. So far, it is not clear which of these face-to-face communication-related BCTs are most effective in changing a patient's unhealthy lifestyle behavior and which provider is more effective in using these face-to-face communication-related BCTs. Many studies in the field of lifestyle interventions focus on one single aspect of behavior such as smoking [21,22] or physical activity [23,24]; included studies are often of low quality [25,26] and interventions are seldom theory based [20]. Many studies into BCTs do appear to be inspired by theories, as for example Prochaska's and DiClemente's transtheoretical model, or Bandura's social cognitive theory [20].

Previous studies show that GPs and nurses (PN or NP) differ in their approach to patients and disease management; nurses spend more time on counseling patients than GPs and during the education and training of nurses there is more emphasis on patient education, lifestyle and disease prevention [27,29]. GPs, on the other hand, may traditionally be considered to have more authority to deliver care to patients. Nevertheless, several studies [27,30,31] suggest that care from GPs and nurses results in similar patient outcomes.

The current review study was set up to answer the following questions:

1. Which face-to-face communication-related behavior change techniques (BCTs) used in interventions are (most) effective for primary health care providers to intervene on patients' lifestyle behavior, i.e. smoking, alcohol, nutrition, weight and physical activity?
2. Which health care provider in primary care (physician or nurse) is more effective in using face-to-face communication-related BCTs?

Methods

Inclusion criteria

A study was included in the review if (1) it concerned a randomized controlled trial (RCT) (2) the study was published in English, (3) the study

population consisted of patients of 18 years or older, (4) the study focused on lifestyle communication about smoking behavior, alcohol use, nutrition intake (or diet/ eating habits), weight or physical activity (exercise) and, in case of secondary prevention the following lifestyle related diseases: type II diabetes, COPD, asthma, cardiovascular disease, heart disease or kidney disease, (5) the population of professionals consisted of at least one health care provider (GP/physician, NP or PN) working within primary care, (6) the study included communication-related BCTs used in interventions by health care providers during individual face-to-face communication with the patient, (7) the study described outcomes on patient level regarding actual lifestyle behavior (self-reported or objective). 'Communication-related BCT' was defined as an interview technique delivered by one primary health care provider during face-to-face communication with one patient. This technique is used to make patients aware of their lifestyle behavior and how to change or maintain this behavior. We included studies that aimed at primary prevention or/and secondary prevention following a diagnosis (see above criterion 4).

Search strategy

A computerized literature search was conducted to find studies that fulfilled all seven inclusion criteria. The following databases were searched in October 2010, without exclusions because of the date of publication or country: PubMed, EMBASE, PsychINFO, CINAHL and The Cochrane Library. Numerous keywords were used in combination in the search. The strategy was formulated in PubMed and adapted to the other databases (see Appendix 1). From the selected search strategies, all references were extracted from the databases and imported in Reference Manager©; duplicates were removed.

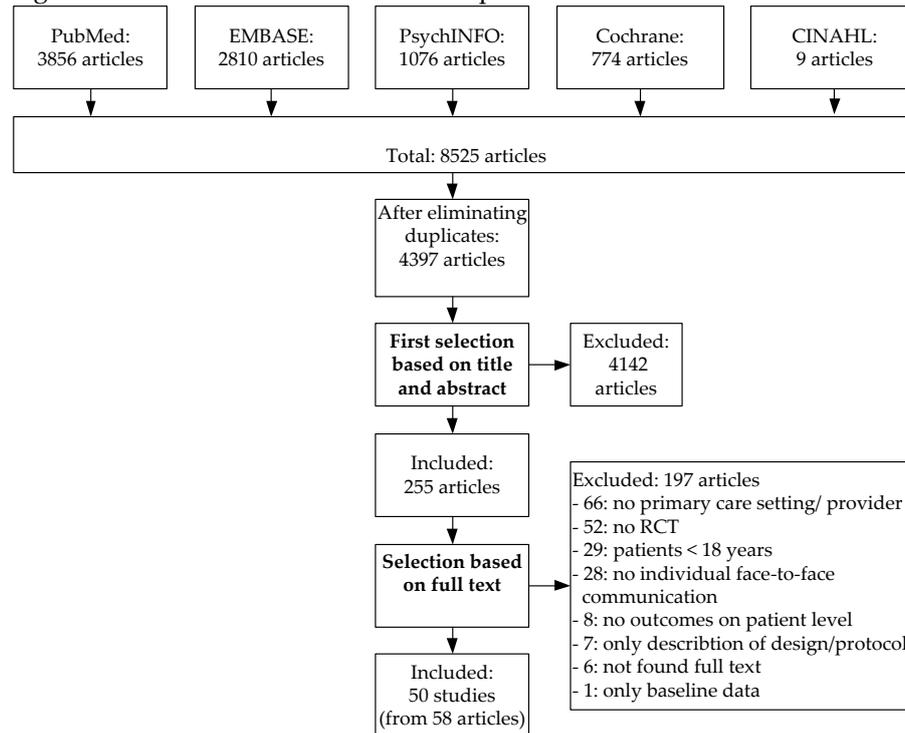
Study selection

A total of 4397 non-duplicate references were found (see Figure 2.1 for flowchart of the inclusion procedure and excluded studies). The first selection for inclusion was performed by two reviewers (JN and SvD) based upon title and abstract. Both reviewers checked 50% of the imported references on title and abstract. Studies were included if they met the above mentioned seven inclusion criteria. This resulted in 323 references. Thereafter, both reviewers checked each other's included references. Agreement between reviewers was high (90%). In case of doubt the full

article was checked. In total 255 references were included after this first selection round.

In the second stage, the reviewers studied the full-text versions of the 255 articles to check the inclusion criteria. Six studies of the 255 could not be found in full text (neither in the Netherlands nor abroad). Ten percent of the 249 full text articles were studied by both reviewers (JN and SvD). Disagreements were resolved by discussion. Fifty-eight articles met all seven inclusion criteria and were therefore assessed on methodological quality. See Figure 2.1 for information about the excluded studies.

Figure 2.1 Flowchart of the inclusion procedure



Quality assessment

The methodological quality of the articles was assessed by two reviewers (JN and SvD) using the criteria list of the Cochrane Collaboration Back Review Group by Van Tulder et al. [32]. The list consists of the following 11 criteria (or questions) for internal validity (see Appendix 2); (1) was the method of randomization adequate, (2) was the treatment allocation

concealed, (3) were the groups similar at baseline regarding the most important prognostic indicators, (4) was the patient blinded to the intervention, (5) was the care provider blinded to the intervention, (6) was the outcome assessor blinded to the intervention, (7) were co-interventions avoided or similar, (8) was the compliance acceptable in all groups, (9) was the compliance acceptable in all groups, (10) was the timing of the outcome assessment in all groups similar, and (11) did the analysis include an intention-to-treat analysis.

Items could be scored as 'done', 'unclear' or 'not done'. All unclear scores were rated as 'not done'. Studies were considered of 'high quality' if at least five (instead of six) out of 11 criteria were scored as 'done'. This cut-off point is adjusted from Van Tulder et al. [32] and used because 'blinding' of health care providers in lifestyle interventions is often not (entirely) possible. Studies were considered of 'low quality' if they fulfilled less than five criteria. In case of doubt, the quality of the study was assessed after discussion between reviewers.

Multiple studies from the same dataset

We identified multiple articles from the same dataset, because these studies can cause a bias by affecting the results of the review more strongly [33]. Therefore, in line with previous research [34] we clustered studies from the same dataset together and referred to the first study (see Table 2.1).

Data extraction

Next, the following characteristics of each included study were described:

1. (First) author, year of publication, country where the study was conducted
2. Population/participants:
number of patients, sex, age, primary/ secondary prevention, type of lifestyle behavior, number of health care providers and their profession
3. Type of intervention(s)
4. Control group
5. Study design
6. If the intervention was based on a theoretical model
7. Duration and frequency of the intervention(s)
8. Outcome measures and significant results
9. Contribution of health care provider (GP/physician and/or nurse, alone or in combination with other health care providers)

Data were extracted from each article by two reviewers independently using a predefined data extraction form. These data were summarized in Tables 2.1 and 2.2. Findings on outcome measures and significant effects for the effective studies are presented in Table 2.3.

Data synthesis

It was not possible to pool the data because of the different methods used to measure outcomes. Therefore, a 'Best Evidence Synthesis' was conducted based upon criteria developed by Van Tulder and colleagues [35] and adapted by Steultjens et al. [36]. This synthesis takes into account the design, quality and outcomes of studies. According to preset criteria (see Appendix 3), the synthesis qualifies results from a sample of studies as 'evidence', 'moderate evidence', 'limited evidence', 'indicative findings' or 'no/insufficient evidence'. At least one high quality RCT is necessary to establish some evidence for an intervention.

BCTs were considered as 'effective' if they provided enough evidence according to the 'Best Evidence Synthesis', taking into account the design (RCT), quality and significant positive outcomes of the studies.

Table 2.1 Characteristics of included studies (n=50)

Nr.	Study: country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
1	Aalto et al. 2000 [57]; Finland; high quality; RCT	118 Early-phase heavy drinkers; no men; aged between 20-60 years	41 General practitioners (GPs) and 15 nurses from five practices	(1) Seven brief sessions by GP and nurse consisting of FRAMES ingredients and self help booklet, (2) three brief sessions by GP consisting of FRAMES ingredients and self help booklet	Advised to reduce drinking at baseline and contact GP in case of health problem	Alcohol	Primary prevention
2	Alterman et al. 2001 [52]; USA; high quality; RCT	240 Smokers, who smoked at least one pack of cigarettes daily; 51.2% men in intervention group ¹ , 55% men in intervention group ² , 46.2% men in intervention group ³ ; aged between 21-65 years	3 Nurse Practitioners (NPs)	(1) Low intensity: 8 weeks of NRT, 1 advice and education (A&E) session with NP, (2) middle intensity: NRT and 4 A&E sessions with NP, (3) high intensity: NRT, 4 A&E sessions with NP, 12 weeks of individualized cognitive behavioral therapy	-	Smoking	Primary prevention
3	Anderson et al. 2005 [68]; USA; high quality; RCT	874 Inactive patients; 54.8% men; aged between 35-75 years, free of serious chronic disease, and not found to have apparent ischemia on a screening treadmill test	Physicians and health educators from 11 practices	(1) Advice only, (2) advice plus behavioral counseling, (3) advice plus behavioral counseling including telephone contact and behavioral classes	-	Physical activity, weight	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
4	Armit et al. 2009 [42]; Australia; high quality; RCT	136 Inactive patients; 40% men; aged between 50-70 years	10 GPs and 3 exercise scientists (ES) from 2 practices	(1) GP group: received brief verbal and written advice, (2) GP+ES group: also received behavior change advice from an ES and follow up calls, (3) GP+ES+P group: also received a pedometer Counseling was based on goal setting, self-monitoring and MI	-	Physical activity	Primary prevention
5	Aveyard et al. 2007 [53]; UK; high quality; RCT	925 Smokers; 47,3% men in basic support group, 49,8% men in weekly support group; age 18 years or above	Practice nurses (PNs) from 26 practices	(1) Basic support: seen before quitting, telephoned around quit day, seen 1 and 4 weeks after the initial appointment, 15 mg nicotine patches, (2) weekly support: basic support and telephone call at 10 days and 3 weeks after the initial appointment, additional visit at 2 weeks, 15 mg nicotine patches	-	Smoking	Primary prevention
6	Beckham 2007 [58]; USA; lower quality; RCT	29 Hazardous drinkers in a low-income rural area; 46,4% men; aged 18 years or older	NP	One MI session with the NP (45-60 min)	No intervention	Alcohol	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
7	Beich et al. 2007 [59]; Denmark; high quality; RCT	906 Risky drinkers; 65.4% men in intervention group, 68.5% men in control group; aged between 18-64 years	39 GPs	Brief counseling consisting of FRAMES ingredients: based on the 'drink-less' protocol (WHO collaborative study 2001)	No intervention	Alcohol	Primary prevention
8	Beresford et al. 1997 [61]; USA; high quality; RCT	2111 Patients; 31% men in intervention group, 33% men in control group; age 18 years or above	Physicians from 28 practices (1 to 3 from each practice)	Self-help booklet and a brief motivational message	No intervention	Nutrition	Primary prevention
9	Bo et al. 2007 [72]; Italy; high quality; RCT	375 Dysmetabolic patients; 41.4% men in intervention group, 42.2% men in control group; aged between 45-64 years	6 Physicians and 8 trained professionals (nutritionists, specialists in endocrinology, and internal medicine)	Detailed verbal and written individualized recommendations from trained professionals, 5 sessions (minimal 60 min), the first a one-to-one meeting, followed by group sessions based on behavioral counseling and focusing on practical lifestyle tips	Standard one time unstructured information given by the physician	Nutrition, physical activity, weight	Primary prevention
10	Bolognesi et al. 2006 [69]; Italy; lower quality; RCT	96 Overweight or (severely) obese patients; 46.9% men; age between 21-70 years	8 GPs	Counseling (15 min) with PACE protocol based on stage of change of the patient	Usual care by GP (15 min per visit)	Physical activity, weight	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
11	Burton et al. 1995 [86]; USA; lower quality; RCT	4195 Patients; 37.3% men in intervention group, 34.5% men in control group; aged 65 years or older	Physicians from 119 practices/clinics	Yearly preventive visits (2 years) and optional counseling visits	Mailed a pamphlet describing good health practices	Smoking, alcohol, physical activity	Primary prevention
12	Campbell et al. 1998 [77]; UK; high quality; RCT	1343 Coronary patients, without terminal illness or dementia and not housebound; 58.2% men, age under 80 years (mean age 66 years)	19 Clinics with 28 nurses (PN, district nurse, health visitors) and GPs	Advice, education, feedback, goal-setting; Symptoms and treatment of coronary heart disease reviewed, use of aspirin promoted, lifestyle assessed, blood pressure and lipid management reviewed. Follow-up: according to clinical circumstances	Usual care by GP	Smoking, physical activity, nutrition	Secondary prevention
13	Efrainsson et al. 2008 [54]; Sweden; high quality; RCT	52 Patients with COPD; 50% men; mean age in intervention group 66 years, mean age in control group 67 years	1 Nurse from a primary care clinic	Standard care and two visits to a nurse specialized in COPD care for self-care education (1 hour per session), based on motivational dialogue and tailored to patient	Usual care (2 visits with 3-5 month interval)	Smoking	Secondary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
14	Elley et al. 2003 [70]; New Zealand; high quality; RCT	878 Sedentary patients; 33% men in intervention group, 34% men in control group; aged between 40-79 years	117 GPs and PNs from 42 practices and exercise specialists (ES)	GPs or PNs were prompted by patient to give oral and written advice on physical activity during usual consultations ('Green prescription programme', including MI). ES continued support by telephone and post	Usual care by GP	Physical activity, weight	Primary and secondary prevention
15	Grandes et al. 2009 [43]; Spain; high quality; RCT	4317 Sedentary patients; 33.1% men in intervention group, 35.8% men in control group; aged between 20-80 years	56 Physicians from 11 practices	Advice about physical activity and a physical activity prescription (goal setting) to the patients that attended an additional appointment, including self-monitoring	Usual care by GP	Physical activity	Primary prevention
16	Hollis et al. 1991 [37]; USA; high quality; RCT	3161 Smokers; 38.4% men in control group, 40.2% men in intervention group1, 44.1% men in intervention group2, 41.4% in intervention group3; age between 18-70 years	40 Physicians and nurse health counselors	Patient counseling: (1) self-quit training assisted by nurse, (2) recruitment to a group program assisted by nurse, (3) combination intervention assisted by nurse	30-sec GP advice message and a brief pamphlet	Smoking	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
-	Hollis et al. 1993 [55]; USA; high quality; RCT	See Hollis, 1991	42 Physicians, 7 physician assistants, 11 NPs and nurse health counselors	See Hollis, 1991	See Hollis, 1991	See Hollis, 1991	See Hollis, 1991
17	Kastarinen et al. 2002 [90]; Finland; high quality; RCT	715 Hypertension patients (systolic blood pressure 140-179 mmHG and/or diastolic blood pressure 90-109 mmHG or antihypertensive drug treatment); 48% men in intervention group, 46% men in control group, aged between 25-74 years	Nurses from 10 practices	Systematic health counseling given by nurses for 2 years: targeting weight, salt, alcohol and saturated fat consumption reduction, increase in physical activity	Usual care by GP and nurse	Weight, nutrition, physical activity, smoking, alcohol	Primary prevention
18	Kerse et al. 1999 [44]; Australia; high quality; RCT	267 Patients; 44% men in intervention group, 48% men in control group; aged 65 years or older	42 GPs	Health promotion advice based on an educational programme, including feedback	Usual care by GP	Physical activity	Primary prevention
-	Kerse et al. 2005 [71]; New Zealand; high quality; RCT	270 Sedentary patients; 37% men; age 65 years or older	See Elley, 2003	See Elley, 2003	See Elley, 2003	See Elley, 2003	See Elley, 2003

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
19	Ketola et al. 2001 [75]; Finland; lower quality; RCT	150 Patients with existing cardiovascular disease or multiple risk factors; 48% men; aged between 33-65 years	5 GPs, 5 nurses, 1 dietician, 1 physiotherapist	Seen by GP and nurse at baseline, 6, 12 and 24 months over two years. Programme tailored to patient according to the risk factor status and needs. This could include booklets of healthy lifestyle habits, individual dietary counseling by a nurse or a dietician, joining a weight reduction group, and physiotherapy programme	Standard care and a booklet on healthy lifestyle habits	Weight, smoking, physical activity	Primary and secondary prevention
20	Kimmonth et al. 1998 [82]; UK; high quality; RCT	360 Diabetic patients; 59% men in intervention group, 60% men in control group; age between 30-70 years	43 GPs and 64 PNs from 41 practices	Routine care plus additional training of doctors and nurses, based on patient-centred care and a patient held booklet encouraging questions	Usual care by GP and nurse	Weight, nutrition, physical activity, smoking	Secondary prevention
21	Koelewijn-van Loon et al. 2009 [87]; Netherlands; high quality; RCT	615 Patients with risk at cardiovascular disease; 45% men; age 18 years or above (mean age 57 years)	24 PNs and GPs from 25 practices	Nurse-led cardiovascular risk management, including risk assessment, risk communication, a decision aid and adapted motivational interviewing	Minimal nurse-led intervention	Smoking, alcohol, nutrition, physical activity	Primary and secondary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
-	Koelewijn-van Loon et al. 2010 [38]; Netherlands; high quality; RCT	See Koelewijn-van Loon, 2009	See Koelewijn-van Loon, 2009	See Koelewijn-van Loon, 2009	See Koelewijn-van Loon, 2009	See Koelewijn-van Loon, 2009	See Koelewijn-van Loon, 2009
22	Lancaster et al. 1999 [56]; UK; high quality; RCT	497 Smokers; 44.6% men in intervention group1, 51.6% men in intervention group2; aged 18 years or above	GPs and PNs from 6 practices	(1) Brief verbal or written advice from a GP plus extended counseling and follow-up from a trained PN, (2) brief advice from a GP alone	-	Smoking	Primary prevention
23	Lauritzen et al. 2008 [91]; Denmark; lower quality; RCT	1507 Patients; 48.7% men; aged between 30-49 years	9 GPs from 4 practices	(1) Group having questionnaires, a broad health test with written advice followed by a normal 10-15 minute consultation on demand, (2) same as intervention group1, but with a planned 45 minute patient-centred consultation	Control group answering questionnaires	Smoking, weight, alcohol, nutrition, physical activity	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
24	Lawton et al. 2008 [45]; New Zealand; high quality; RCT	1089 Physical inactive patients; no men; aged between 40-74 years	GPs and PNs from 17 practices	The green prescription: briefly counsel (7-13 minutes) patients using MI techniques to increase physical activity, six month follow-up visit and monthly telephone support over nine months	Usual care by GP and PN	Physical activity	Primary prevention
25	Lear et al. 2006 [83]; Canada; high quality; RCT	302 Patients with ischemic heart disease; 83% men in intervention group, 82% men in control group; mean age 64.8 year in intervention group, mean age 63.4 year in control group	Physicians and case manager (dietician or exercise specialist if necessary)	Exercise sessions, telephone follow-ups, lifestyle and risk factor counseling sessions, and reports to the participants' family physicians	Usual care by GP	Physical activity, nutrition, weight, smoking	Secondary prevention
26	Lee et al. 2007 [46]; Taiwan; high quality; RCT	202 Patients with mild to moderate hypertension; 62.7% men in intervention group, 54% men in control group; aged 60 years and over	Public health nurse and doctors	Six-month community-based walking intervention based on self-efficacy theory, nurse provided both face-to-face and telephone behavioral support designed to assist participants to increase their walking	Usual care by GP and/or nurse	Physical activity	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
27	Little et al. 2004 [47]; UK; high quality; RCT	152 Sedentary patients with risk at cardiovascular disease; 45.6% men in intervention group ¹ , 41.4% men in intervention group ² , 46.6% men in intervention group ³ , 44.3% men in control groups; aged 18 years or older	GPs and PNs from 4 practices	(1) Exercise prescription: GPs briefly discussed the benefits of exercise, targets, how to start, anticipating relapse, wrote a prescription for 30 minutes, 5 times a week of brisk walking, (2) counseling session: nurses discussed the same issues as with exercise prescription, a detailed motivational discussion, identifying a precise time and place to start, and agreed and signed a contract, (3) booklet: the health education authority booklet Getting active, feeling fit was used	Control group for each intervention (no GP vs GP, no nurse vs nurse, no booklet vs booklet or combination of interventions)	Physical activity	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
28	Logue et al. 2005 [73]; USA; high quality; RCT	665 Obese or overweight patients; 33% men in intervention group 1, 30% men in intervention group2; aged between 40-69 years	Physicians from 15 practices, dietician and weight loss advisor	(1) AUC: dietary and exercise advice, prescriptions, and three 24-hour dietary recalls every 6 months, (2)TM-CD: included AUC elements plus "stage of change" (SOC) assessments for five target behaviors every other month, mailed SOC, target behavior-matched workbooks, monthly telephone calls from a weight-loss advisor	-	Weight, physical activity, nutrition	Primary prevention
29	McManus et al. 2005 [85]; UK; high quality; RCT	400 Patients; 47% men, age between 35-75 years	GPs and PNs	Patients used electronic blood pressure machines (self-monitoring), received card with blood pressure target and advice to visit GP or PN if pressure was above target (feedback)	Information sheet on self help measures to lower blood pressure	Smoking, alcohol, physical activity, weight	Primary prevention
30	Munoz et al. 2007 [84]; Spain; lower quality; RCT	983 Coronary patients; 75% men; age between 30-75 years	23 Practices with more than 200 GPs	GPs followed guidelines on cardiovascular prevention, recommend healthy lifestyle, measuring blood pressure, weight, adjusting treatment and medication	Usual care by GP	Smoking, physical activity, nutrition (Mediterranean diet), weight	Secondary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
-	Murchie et al. 2003 [78]; UK; high quality; RCT	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998
-	Murchie et al. 2004 [79]; UK; high quality; RCT	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998	See Campbell, 1998
31	Noknoy et al. 2010 [39]; Thailand; high quality; RCT	117 Hazardous drinkers; 91% male; age between 18-65 years	Nurses in 8 practices	Three 15 min counseling sessions: motivation to change (MI) according to stage of change on day 1, at 2 and 6 weeks	Patients completed research assessment only	Alcohol	Primary prevention
32	Pritchard et al. 1999 [92]; Australia; high quality; RCT	273 Patients with hypertension and/or Diabetes type 2 and/or overweight; 28% men, age between 25-65 years	GPs and dieticians	(1) Dietician group: 6 individual counseling sessions spaced equally over 12 months, focusing on nutrition and exercise (first 45 min, next 15 min) by dietician, (2) doctor/dietician group: same as group 1, but doctor invited patients to the study and reviewed progress at 2 of the 6 sessions (5 min)	Control group received results of initial measurements and if they had queries were advised to discuss these with whom they had made an appointment	Weight, nutrition, physical activity, smoking, alcohol	Primary and secondary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
33	Ramos et al. 2010 [40]; Spain; high quality; RCT	287 Smokers who were in the preparatory phase; 46% men; mean age 45 years	Physicians and nurses from 10 practices	(1) Intensive group: counseling, psychological support based on MI. 5 follow-up sessions, pharmacological treatment, (2) intensive individual: counseling, psychological support based on MI. 5 follow-up sessions, pharmacological treatment	minimal: pharmacological treatment, basic MI counseling	Smoking (also baseline data on alcohol, physical activity and nutrition)	Primary prevention
34	Reed et al. 2008 [48]; USA; lower quality; RCT	237 Patients; 25.9% men in intervention group, 28.8% men in control group1, 26.3% in control group2; age 18 years or older	12 Physicians, 4 nurses and 1 NP	Counseling (using "6 As" method) and educational map (with geographic information of all recreational facilities within 2 mile radius)	(1) Counseling only group (2)Standard care	Physical activity	Primary prevention
35	Reid et al 2000 [65]; Australia; high quality; RCT	45 Patients with history of hypertension; 43% men in withdrawal group, 50% men in continued group; age between 18-60 years	13 GPs	(1) Continued medication: medication, counseling regarding lifestyle change, self-help material, (2) withdrawal: medication stop over 2-week period, counseling regarding lifestyle change, self-help material	-	Physical activity, nutrition	Primary prevention
36	Rubak et al. 2009 [88]; Denmark; high quality; RCT	265 Diabetic patients; age between 40-69 years	65 GPs	GPs received a motivational interviewing (MI) course	GPs not receiving a MI course	Smoking, alcohol, nutrition, physical activity	Secondary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
37	Rubio et al. 2010 [41]; Spain; high quality; RCT	752 Binge drinkers; 65% men; age between 18-65 years	74 Family physicians and office nurses	Brief intervention: 2 short counseling sessions 4 weeks apart (10-15 min). physicians used script workbook. 2 follow-up sessions by nurse	Patients received a booklet on general health issues and were followed-up at 6, 12 months	Alcohol	Primary prevention
38	Sacerdote et al. 2006 [66]; Italy; high quality; RCT	3186 Patients who were not obese or affected by chronic or severe diseases; 50% men; age between 18-65 years	33 GPs	Educational personalized intervention and brochure on basic healthy diet based on Italian guidelines for correct nutrition. Follow-up advice every 6 months	A similar and non-personalized conversation without the use of a brochure	Nutrition, weight	Primary prevention
39	Schaus et al. 2009 [60]; USA; lower quality; RCT	363 High-risk drinking students; 48% men; age 18 years and older (mean age 20.6 years)	Primary care providers (intervention: 2 physicians, 1 physician's assistant, 1 NP)	2 Brief sessions based on MI techniques and cognitive behavioral skills training (20 min)	Participants were assigned to university health services providers who received no training in the MI protocol	Alcohol	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
40	Spink et al. 2008 [49]; Canada; high quality; RCT	90 Patients who were regularly active, but were thinking about increasing their activity level ('contemplators'); 17% male in intervention group1, 19% male in intervention group2; age 18 or older (mean age 43 year)	24 Physicians	(1) Counseling: physician-directed-modified PACE protocol, (2) enhanced counseling: physician-directed-modified PACE protocol and telephone counseling	-	Physical activity	Primary prevention
41	Step toe et al. 1999 [80]; UK; lower quality; RCT	883 Patients with increased risk of coronary heart disease (regular cigarette smoking, high serum cholesterol concentration and/or high body mass index combined with low physical activity); 46% men; mean age 46.7 years	PNs in 20 practices (one PN in each of the 10 intervention practices was trained)	Brief behavioral counseling based on stage of change model to reduce smoking, dietary fat intake and increase physical activity. Patients with 2 risk factors invited for 3 sessions, with 1 risk factor for 2 sessions (20 min per session). In between telephone counseling	Usual care by PN	Smoking, nutrition, physical activity	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
-	Stepptoe et al. 2000 [62]; UK; lower quality; RCT	365 Patients with elevated cholesterol; 49% men; mean age 52.1 years	See Stepptoe, 1999	Brief behavioral counseling based on stage of change model to reduce dietary fat intake. Patients with 2 risk factors invited for 3 sessions, with 1 risk factor for 2 sessions (20 min per session). In between telephone counseling	See Stepptoe, 1999	Nutrition	Primary prevention
-	Stepptoe et al. 2001 [81]; UK; lower quality; RCT	See Stepptoe, 1999	See Stepptoe, 1999	See Stepptoe, 1999	See Stepptoe, 1999	See Stepptoe, 1999	See Stepptoe, 1999
42	Stepptoe et al. 2003 [63]; UK; high quality; RCT	271 Patients from a low income and ethnically mixed population; 39% men; aged between 18-70 years (mean age 43 year)	Nurses from one practice in a deprived inner city area	(1) Brief individual behavioral counseling based on stage of change model (15 min), (2) time matched nutrition education counseling (15 min)	-	Nutrition	Primary prevention
43	Swinburn et al. 1998 [50]; New Zealand; high quality; RCT	456 Sedentary patients; 41% men in intervention group1, 36% in intervention group2; mean age 49 years	37 GPs in two practices	(1) Verbal advice and written advice (education), (2) verbal advice only	-	Physical activity	Primary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
44	Ter Bogt et al. 2009 [64]; Netherlands; lower quality; RCT	457 Overweight or obese patients with hypertension and/or dyslipidemia; 48% men; mean age 56 years	NPs and GPs from 11 practices (varying from 1 to 7 GPs and 1 to 3 NPs per location)	4 Individual visits to NP and one feedback session by telephone for lifestyle counseling with guidance of NP using a standardized computerized software program	Usual care by GP	Weight	Primary prevention
45	Tonstad et al. 2007 [89]; Norway; lower quality; RCT	51 Patients with hypertension; 67.7% men in intervention group, 83.3% men in control group; aged 30 to 69 years	1 Nurse, physicians	Nurse-led lifestyle counseling based on stages of change: monthly for 6 months (first 60 min, next sessions 30 min)	Brief advice, recommended to visit their physician for care during the study and recalled for the final evaluation after 6 months	Smoking, nutrition, physical activity, alcohol	Primary prevention
46	Van den Bemt et al. 2009 [76]; Netherlands; high quality; RCT	189 Patients with COPD; 56% men in intervention group, 47% men in control group; age 25 years or older	GPs from 34 practices, respiratory experts and lung function technicians	Ongoing monitoring of COPD patients with respiratory expert recommendations (feedback) for GP	Usual care, with spirometry at baseline and 2 years	Weight, smoking, physical activity	Secondary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
47	Van Sluijs et al. 2005 [51]; Netherlands; high quality; RCT	358 Patients diagnosed with hypertension, hypercholesterolemia and/or non-insulin-dependent diabetes and not in the maintenance stage for regular physical activity; 50.8% men; aged between 18-70 years (mean age 55.5 years)	29 GPs	2 Visits with GP and 2 telephone booster calls by a physical activity counselor: both using PACE physical activity program	10 min session at baseline by GP	Physical activity	Primary and secondary prevention
48	Whittemore et al. 2009 [74]; USA; lower quality; RCT	58 Patients at risk for diabetes type 2, metabolic syndrome or impaired glucose tolerance (IGT), moderately low-income sample; 8% men; age 21 years or above	7 NPs from 4 practices, 1 nutritionist	Lifestyle change program: culturally relevant education on nutrition, exercise and diabetes type 2 prevention, behavioral support in identifying lifestyle change goals and barriers, MI when participants were unable to achieve lifestyle goals	Enhanced standard care program	Nutrition, weight, physical activity	Primary prevention
49	Willaing et al. 2004 [67]; Denmark; high quality; RCT	503 Patients with high BMI, dyslipidemia and/or type 2 diabetes; 29% men in dietician group, 34% men in GP group; age 18 years or older	60 GPs and 2 dieticians	(1) Nutritional counseling by GP (first session 30 min, later 12 min) GP was trained in MI, (2) nutritional counseling by dietician (first session 1 hour, later 30 min)	-	Nutrition, weight	Primary and secondary prevention

Table 2.1 - To be continued -

Nr.	Study; country; quality; design	Population (patients)	Health care providers	Intervention group(s)	Control group	Type of lifestyle	Primary/secondary prevention or both ^a
50	Woollard et al. 2003a [94]; Australia; lower quality; RCT	212 Patients with hypertension, type 2 diabetes or coronary heart disease; 44% men in control group, 52% men in intervention group ¹ , 51% men in intervention group ² ; aged between 20-74 years	PNs and GPs from 7 practices	(1) Low level: one individual face-to-face counseling session and monthly telephone contacts for a year (10-15 min); (2) High level: individual face-to-face counseling up to 1h monthly for 1 year Counseling was based on MI	Usual care by GP	Nutrition, weight, physical activity, alcohol, smoking	Primary and secondary prevention
-	Woollard et al. 2003b [93]; Australia; lower quality; RCT	See Woollard, 2003a	See Woollard, 2003a	See Woollard, 2003a	See Woollard, 2003a	See Woollard, 2003a	See Woollard, 2003a

GP, general practitioner;

NP, nurse practitioner;

PN, practice nurse;

NRT, nicotine replacement therapy;

BMI, body mass index;

MI, motivational interviewing;

FRAMES, feedback, responsibility, advice, menu, empathy and self-efficacy;

PACE, patient-centred assessment and counseling for exercise;

^a Primary prevention refers to inhibiting the development of disease before symptoms occur. Secondary prevention focuses on people already affected by a disease [10,28,77]

Results

In Table 2.1 an overview of the characteristics and quality of the 50 included studies (from 58 articles) is given.

Included studies

Study characteristics

The publication year of the studies varied from 1991 [37] to 2010 [38-41]. Ten studies were carried out in the USA, eight studies in the UK, five in Australia, four in the Netherlands, in Denmark, and in Spain, three in New Zealand, Finland, and Italy, two in Canada and one in Thailand, Taiwan, Norway, and Sweden.

Methodology quality and design

The methodology quality assessment yielded 37 high quality studies and 13 studies with lower quality. The following criteria were most often disobeyed: blinding, allocation concealment and intention-to-treat analysis. All studies described randomized trials, either with a control (n=39) or a comparison (n=11) group (Table 2.1).

Population characteristics

Twenty-five of the studies focused on a participant's single lifestyle behavior; ten on physical activity [42-51], six on smoking behavior [37,40,52-56], six studies on alcohol [39,41,57-60], two on nutrition [61-63] and one study on weight [64].

The other twenty-five reported on several lifestyle behaviors; one on physical activity and nutrition [65], two studies on nutrition and weight [66,67], three studies on physical activity and weight [68-71], three on nutrition, physical activity and weight [72-74], two on smoking, physical activity and weight [75,76], two on smoking, physical activity and nutrition [77-81], three on smoking, weight, nutrition and physical activity [82-84], one on smoking, alcohol, weight and physical activity [85], four studies on smoking, alcohol, nutrition and physical activity [38, 86-89]. Four studies reported on all lifestyle behaviors included for this study [90-94]. Most studies (n=36) were aimed at primary prevention, seven focused on secondary prevention following a diagnosis and seven aimed at both primary- and secondary prevention (see Table 2.1). Of the studies aimed at secondary prevention, three described patients diagnosed with heart or

vascular disease [77-79,83,84], two reported on patients diagnosed with COPD [54,76] and two described patients with type II diabetes [82,88].

Theoretical basis

Twenty-three studies specified the theoretical basis of the intervention(s). Many interventions were based upon more than one theory. Prochaska's and DiClemente's transtheoretical model (TTM) or stages of change model was referred to as the theoretical idea behind interventions in twenty-one studies [37,39,40,42,46,47,49,51,54-56,61-63,65,69-71,73,80,81,83,88,89,93,94]. This model divides the process of behavioral change into five stages, from precontemplation to maintenance. In the articles, information on lifestyle behavior was adapted to a participant's readiness (stage of change) to adopt a new behavior. Eight studies [43,46,51,61,63,68,69,83] described an intervention based on Bandura's social learning theory or social cognitive theory (SCT). A central concept of this theory is self-efficacy. Self-efficacy is a person's sense of confidence in the ability to perform a particular behavior. Furthermore, one study [73] referred to Wagner's chronic disease care model. This model emphasizes the centrality of an informed activated patient within the care process. Another study [47] referred to the theory of planned behavior, which addresses attitudes and perceived behavioral control. Finally, the health belief model (HBM) was referred to [43]. This model uses perceived susceptibility, severity, benefits, barriers, cues to action and self-efficacy as constructs.

Six studies described which constructs of the theory were chosen and translated into BCTs [39,43,46,68,69,73]. For example, Grandes and colleagues [43] described for each BCT whether it was based on the HBM model, SCT model or both. Seventeen studies were less explicit about the connection between theory and BCT [37,40,42,47,49,51,54-56,61-63,70,71,80,81,83,88,89,93,94].

Intervention characteristics and outcome measures

During the interventions, the face-to-face communication between patient and health care provider ranged from (seven studies with) one session [49,50,58,61,69-71,91] to (one study with) 15 sessions [83]. The number of face-to-face sessions does not include separate measurement sessions of biomedical or questionnaire data (only if part of the face-to-face BCT), telephone calls or written advice that were sometimes also part of the

interventions. In three studies the frequency of the face-to-face communication sessions was not reported [44,82,88].

The face-to-face communication sessions lasted from 30 seconds [37,55] to 60 minutes [54-72,89]. Fourteen studies did not report the duration of the face-to-face sessions [40,44,46-48,65,70,75,76,82-84,88,90].

Most studies (n=40) reported on both subjective (self-reported) and objective outcome measures. For example, Alterman and colleagues [52] described outcomes on cigarettes a day (subjective), carbon monoxide level and cotinine (objective measures). However, eight studies described self-reported outcomes only [44,48-51,59,62,68,79,88] and two studies exclusively objective outcomes [64,92].

As described above, the intensity of interventions and BCTs (number of face-to-face sessions and duration of sessions) differed to a great extent. Therefore, we could not determine the impact of intensity on outcomes.

Face-to-face communication-related behavior change techniques

In Table 2.2 the BCTs of the studies are provided, together with significant outcomes and the contribution of the health care providers.

In about half of the studies (n=27) more than one face-to-face communication-related BCT was used. These studies combined for example techniques such as advice and education [50,52,66,84,91] or goal setting, self-monitoring and motivational interviewing [42]. Twenty-three studies described single BCT i.e. behavioral counseling or motivational interviewing or motivational message or patient-centred care (see Table 2.2). Hereby, a 'single' BCT refers to the label of the technique; i.e. a single technique could have more than one underlying working mechanism.

Table 2.2 Effects of communication related behavior change techniques in studies (n=50)^a

Communication-related behavior change techniques (used in interventions)	Number of studies	Positive significant effects (%)^{b,c}	Contribution GPs (or physicians), nurses, other health care provider
Advice, behavioral counseling	3 high quality studies [37,55,56,68]	66.7%	1 study: GPs and health educator [68*], 2 studies: GPs and nurses [37,55* 56]
Advice, behavioral counseling, self-monitoring	1 high quality study [73]	-	1 study: GPs, dietician, weight loss advisor [73]
Advice, education	3 high quality studies [50,52,66], 2 lower quality studies [84,91]	50%	1 study: nurses [52], 4 studies: GPs [66,91* 50,84]
Advice, education, cognitive behavior therapy	1 high quality study [52]	100%	1 study: nurses and therapists [52]*
Advice, education, feedback	1 high quality study [44]	100%	1 study: GPs [44*]
Advice, education, feedback, goal setting	1 high quality study [77-79]	100%	1 study: nurses [77-79*]
Advice, education, goal setting, self-monitoring	1 high quality study [43]	100%	1 study: GP and nurses [43*]
Behavioral counseling/support	10 high quality studies [41,46,49,51,53,63,65,72,90,92], 3 lower quality studies [62,69,80,81,89]	76.9%	6 studies: nurses [46,62,63,80,81,90* 53,89], 1 study: GPs and trained professionals [72*], 1 study: GPs and dieticians [92*], 1 study: GPs and PA counsellors [51*], 3 studies: GPs [49,69* 65], 1 study: GPs and nurses [41*]
Behavioral counseling, education	1 lower quality study [48]	100%	1 study: GPs and nurses [48]
Behavioral counseling, feedback	1 lower quality study [64]	+/-	1 study: nurses [64]
Behavioral counseling, motivational interviewing	1 high quality study [67]	+/-	1 study: GPs [67]
Education, motivational dialogue/interviewing, behavioral counseling	2 high quality studies [47,54], 1 lower quality study [74]	66.7%	1 study: 1 nurse [54*], 1 study: GPs and nurses [47], 1 study: nurses and nutritionist [74*]

Table 2.2 - To be continued -

Communication-related behavior change techniques (used in interventions)	Number of studies	Positive significant effects (%) ^{b,c}	Contribution GPs (or physicians), nurses, other health care provider
Feedback, responsibility, advice, menu, empathy, self-efficacy	2 high quality studies [57,59]	-	1 study: GPs and nurses [57], 1 study: GPs [59]
Goal setting, self-monitoring, motivational interviewing	1 high quality study [42]	-	1 study: GPs and exercise scientist [42]
Monitoring, feedback	1 high quality study [76]	-	1 study: GPs [76]
Motivational interviewing	5 high quality studies [39,40,45,70,71,88], 3 lower quality studies [58,60,93,94]	75%	3 studies: nurses [39,58* 45], 4 studies: GPs and nurses [40,60,70,71* 93,94], 1 study: GPs [88*]
Motivational message	1 high quality study [61]	+/-	1 study: GPs [61]
Patient-centred care	1 high quality study [82]	-	1 study: GPs and nurses [82]
Patient-centred care, advice, education	1 lower quality study [91]	100%	1 study: GPs [91]
Risk/need assessment (screening), behavioral counseling	1 high quality study [83], 2 lower quality studies [75,86]	33.3%	1 study: GPs and case managers [83*], 1 study: GPs and nurses (and some dietician, physiotherapist) [75], 1 study: GPs [86]
Risk assessment, risk communication, decision support, motivational interviewing	1 high quality study 38,87	-	1 study: nurses 38,87
Self-monitoring, feedback	1 high quality study [85]	+/-	1 study: GPs and nurses [85]

^a Number of studies in table exceeds 50 because several studies reported more than one intervention group which resulted in different behavior change techniques (BCTs) within one study

^b Percentage of studies with significant improvement divided by total number of studies on this technique, as earlier used in a review of Van Achterberg et al. [26]

^c If in both intervention and control group the same BCT (for example motivational interviewing) was used, but in different intensity or form of delivery, and there was a significant effect in both groups but not between groups, we indicated that there was a significant effect for this BCT. But, if a BCT was partly significant we did not count this effect as significant

*= significant contribution of health care provider (in case of significant effect on BCT).

-=not significant. +/- = partly significant

Effective face-to-face communication-related behavior change techniques

Twenty-eight of the 50 studies reported significant outcomes from the communication-related BCTs used in interventions. In principle, these BCTs were counted as effective. However, based on the principles of a 'Best Evidence Synthesis' twenty-six of the twenty-eight studies provided some to moderate evidence for the BCT provided. This suggests that two studies [48,91] provided only 'indicative findings'. Therefore, the BCTs in these studies, namely 'behavioral counseling and education' [48] and 'patient-centred care, advice and education' [91], were not counted as effective. The 26 effective studies represent a wide range of outcome measures and significant effects (Table 2.3). For smoking behavior the outcome measures presented are self-reported smoking rates (i.e. cigarettes a day) [37,40,52,54,77,80,83,90] and biochemical measurement of carbon monoxide level [37,40,52,80]. With respect to alcohol use the studies present outcomes on self-reported alcohol use (i.e. drinks a day) [39,41,58,60,90] and blood alcohol concentration [39,41,58,60].

Outcome measures described on nutrition are self-reported diet behavior (e.g. fat, fiber, fruit, vegetable, calorie intake) [63,66,72,74,77,80,83,90] and measures as weight [66,80,92], body mass index [40,66,80,90] and waist circumference [72,74], among others. On physical activity behavior the presented outcome measures are self-reported physical activity level [43,44,46,49,70,72,74,77,80,83,90] and readiness for physical activity (self-efficacy) [49,51,69]. Studies also presented outcomes on blood pressure [46,66,80,90,92], lipid management [74,77] and quality of life [43,70,83], among others (see Table 2.3).

The effective studies were also aimed at different patient populations within the context of primary care. For example, three of the effective studies [58,63,74] were aimed at a (moderately) low income population, of which one study [63] specifically indicated that 'differences were maintained when analyses were restricted to participants with low incomes' (Table 2.3). Eighty-one percent (n=21) of the effective studies were of high quality.

Table 2.4 shows the 26 effective face-to-face communication-related BCTs. Sixteen of these studies outlined single BCTs [39-41,46,49,51,58,60,62,63,69-72,80,81,88,90,92] and ten studies described a combination of BCTs [37,43,44,52,54,55,66,68,74,77-79,83]. 'Behavioral counseling' was most frequently used as an effective BCT (15 times out of 26), next to motivational interviewing (eight times out of 14), education (seven times out of 14) and advice (seven times out of 16). However, these results show that these

techniques were also provided in less successful studies. These BCT were less successful because of the context of the study, as for example the design [56,75,84,86,94] or patient characteristics [47,64,65]. Although, all studies took place within the context of primary care and BCTs were always provided by a physician, nurse or both (in combination with other professionals). Besides, the less successful studies were more often of low quality (36%) compared to the effective studies (19%). Feedback, risk-assessment, goal-setting, cognitive behavior therapy and self-monitoring were less often provided, but also showed significant effects on patients' outcomes. The effective face-to-face communication-related BCTs did not focus exclusively on one particular lifestyle behavior (e.g. smoking). Sixteen of the 26 effective studies described their theoretical foundation [37,39,40,43,44,46,49,51,54,55,62,63,68-71,80,81,83,88], of which five studies [39,43,46,68,69] reported the chosen BCT constructs.

Contribution of health care providers

Table 2.2 shows the contribution of the different health care providers, both as providers of effective and less successful BCTs.

Five of the 26 effective communication-related BCTs in primary care were provided by physicians [44,49,66,69,88], eight by nurses [39,46,54,58,62,63,77-81,90] and five by both nurses and physicians [37,40,41,43,55,60,70,71]. In five studies the effective BCT was provided by physicians in combination with health educators [68], trained professionals [72], physical activity counselors [51], dieticians [92], or case managers [83]. In two studies the effective BCT was provided by nurses in combination with therapists [52], or nutritionists [74].

Table 2.3 Outcome measures & significant effects of studies with effective communication related behavior change techniques (n=26)

Study	Outcome measures	Significant effects
Alterman 2001 [52]	Self-reported: cigarettes a day Objective: biochemical measurements (carbon monoxide level and urine samples)	High biochemically abstinence rates through one year for group 1 and 3 Significant lower abstinence rates for group 2
Anderson 2005 [68]	Self-reported: stress, body function, self-efficacy, physical activity recall, social support	Reduction in daily stress and improvement in satisfaction with body function for women in group 2 and 3. For men reduction of stress in all groups. Changes in barriers self-efficacy significantly associated with stress reduction
Beckham 2007 [58]	Self-reported: alcohol use (drinks a day), symptoms of alcohol withdrawal or treatment for alcohol problems Objective: gamma-glutamyltransferase (GGT) blood test	Significant decrease in GGT and average number of drinks a day for treatment group. Control group a smaller reduction in number of drinks a day
Bo 2007 [72]	Self-reported: fat intake, fiber intake, calories intake, physical activity level Objective: weight, waist circumference, Body mass index (BMI), diastolic blood pressure, fasting glucose, triglycerides, hs-CRP, and uric acid values	Intervention significantly reduced total/ saturated fat intake and increased polyunsaturated fat/fiber intake and exercise level compared to the controls. Intervention group: reduced metabolic syndrome, absolute risk reduction, the prevalence of central obesity, hypertriglyceridemia, incidence of diabetes. Weight, waist circumference, BMI, diastolic blood pressure, fasting glucose, triglycerides, hs-CRP, and uric acid values decreased in intervention group, while most variables worsened in the controls
Bolognesi 2006 [69]	Self-reported: readiness for physical activity and self-efficacy Objective: BMI and abdominal girth	The experimental group had significantly better BMI and abdominal girth compared with the control group after a 5- to 6-month follow-up. The experimental group progressed in their stage of physical activity readiness and increased their self-efficacy
Campbell 1998 [77]	Self-reported: aspirin use, diet, smoking, exercise Objective: blood pressure, lipid management	Reduced mortality, coronary event rated in medium term. Improved moderate exercise, diet, aspirin management, blood pressure, lipid management in intervention group at one year

Table 2.3 - To be continued -

Study	Outcome measures	Significant effects
Efrainsson 2008 [54]	Self-reported: smoking, symptoms of cough, phlegm, dyspnoea and wheezing, quality of life Objective: respiratory function, oxygen saturation	Increase in the intervention group on quality of life, the number of patients who stopped smoking and patients' knowledge about COPD, compared to control
Elley 2003 [70]	Self-reported: quality of life, physical activity level and total energy Objective: blood pressure, BMI, cholesterol concentration, risk at cardiovascular disease	Mean total energy expenditure increased and leisure exercise more in the intervention group than in the control group. Measures of self-rated general health, role physical, vitality, and bodily pain improved sign more in the intervention group
Grandes 2009 [43]	Self-reported: physical activity level, quality of life Objective: maximum oxygen uptake, estimated by an exercise test	Intervention patients increased physical activity more than controls. The proportion of the population achieving minimal physical activity recommendations was higher in the intervention group
Hollis 1991 [37]	Self-reported: smoking (quit) rates, stage of change Objective: carbon monoxide level	Subjects in the three intervention conditions were more likely to report a serious quit attempt than control group. Quit rates at 3 months were also higher
Kastarinen 2002 [90]	Self-reported: lifestyle data on nutrition, physical activity, smoking, alcohol Objective: lipids, blood pressure, BMI	Among participants with no antihypertensive drug treatment, the net reductions after 1 and 2 year in blood pressure were significant in favor of the intervention group. Weight decreased and physical activity level increased at 12, 24 months in intervention group compared to control. Alcohol decreased only in year 1
Kerse 1999 [44]	Self-reported: physical activity level, functional status, health, immunization status, social contacts, psychological wellbeing, drug usage, rate of influenza vaccination	Patients in the intervention group had increased walking, frequency of pleasurable activities and self-rated health compared with the control group
Lear 2006 [83]	Self-reported: lifestyle (physical activity, nutrition, smoking), cardiovascular risk scores (Framingham), quality of life Objective: blood pressure, cholesterol, exercise capacity, BMI, waist circumference, lipid	Cardiovascular risk score, cholesterol and systolic blood pressure were significantly improved in the intervention group. There were no significant differences with respect to lifestyle factors between the groups
Lee 2007 [46]	Self-reported: self-efficacy, walking frequency Objective: systolic and diastolic blood pressure	Mean change in systolic blood pressure decreases both in intervention and control group, but significantly more in intervention group. Improvement in exercise self-efficacy scores was greater among intervention group participants. Intervention group participants were more likely to report walking more, but no differences were observed in diastolic blood pressure

Table 2.3 - To be continued -

Study	Outcome measures	Significant effects
Noknoy 2010 [39]	Self-reported: alcohol consumption Objective: serum gamma-glutamyl transferase	Self-reported drinks per drinking day, frequency of hazardous drinking assessed either on a daily or weekly basis, and of binge drinking sessions were reduced in the intervention group more than in the control group after both 3 and 6 months. However, serum gamma-glutamyl transferase increased in both groups
Pritchard 1999 [92]	Objective: weight, blood pressure, BMI, height	Both intervention groups reduced weight and blood pressure compared with the control group. Patients in intervention group 2 (doctor-dietician) were more likely to complete the 12 month programme than those in intervention group 1 (dietitian)
Ramos 2010 [40]	Self-reported: continued smoking abstinence Objective: carbon monoxide	No significant differences between the results of individual and group interventions. Continued abstinence at 12 months highest for intensive individual intervention group. The effectiveness of intensive smoking interventions was lower than expected; only overall visit length showed a statistically significant association with smoking cessation
Rubak 2009 [88]	Self-reported: patient-doctor relationship, type of counseling, degree to which behavior tends to be self-determined, beliefs and understanding of type 2 diabetes, self-care activities related to type 2 diabetes	Patients in the intervention group were significantly more autonomous and motivated in their inclination to change behavior after 1 year compared to the control group. Patients in the intervention group were also significantly more conscious of the importance of controlling their diabetes, and had a significant better understanding of the possibility of preventing complications
Rubio 2010 [41]	Self-reported: frequency of binge drinking episodes and weekly alcohol intake Objective: gamma-glutamyl transferase	At 12-months significant reductions in binge-drinking status, number of episodes of binge drinking, number of drinks weekly and frequency of excessive alcohol intake in 7 days
Sacerdote 2006 [66]	Self-reported: food frequency, healthy diet score Objective: weight, blood pressure, BMI	The intervention group showed a slightly reduced net intake of meat and a slightly increased net intake of fruits and vegetables, fish products, and olive oil. BMI changed only in the intervention group. The 'healthy diet score' in intervention group was significant higher in the end, and also compared to control group
Schaus 2009 [60]	Self-reported: alcohol consumption, high-risk drinking alcohol-related harms Objective: blood alcohol concentration	Brief interventions results in significantly decreased alcohol consumption, high-risk drinking, and alcohol-related harms

Table 2.3 - To be continued -

Study	Outcome measures	Significant effects
Spink 2008 [49]	Self-reported: physical activity readiness (stages of change), levels of physical activity (frequency, intensity, duration), energy expenditure	Mean energy expenditure and frequency of moderate activity, and duration significantly increased over time. No significant interactions between group and time were found. The effectiveness of telephone support over and above that of physician counselling was not supported
Stephens 1999 [80]	Self-reported: diet, exercise, smoking habits Objective: blood pressure, serum total cholesterol concentration, weight, BMI, and smoking cessation (with biochemical validation)	Favourable differences were recorded in the intervention group for dietary fat intake, regular exercise, and cigarettes smoked per day at 4 and 12 months. Systolic blood pressure was reduced to a greater extent in the intervention group at 4 but not at 12 months. No differences were found between groups in changes in total serum cholesterol concentration, weight, body mass index, diastolic pressure, or smoking cessation
Stephens 2003 [63]	Self-reported: number of portions of fruit and vegetables eaten per day Objective: plasma beta carotene, alpha tocopherol, and ascorbic acid concentrations, and 24 hour urinary potassium excretion	Consumption of fruit and vegetables increased from baseline to 12 months in both intervention groups. The proportion of participants eating five or more portions a day increased. Plasma beta carotene and alpha tocopherol concentrations increased in both groups, but the rise in beta carotene was greater in the behavioural group. There were no changes in plasma ascorbic acid concentrations or urinary potassium excretion. Differences were maintained when analysis was restricted to participants with incomes \leq £400 (£596, \$640) a week
Van Sluis 2005 [51]	Self-reported: self-efficacy, benefits of physical activity, barriers to physical activity (smoking), social support, processes of change	Significant positive effect was observed on self-efficacy, use of cognitive and behavioral processes of change, at 8 weeks and 6 months. The intervention group also perceived fewer barriers for regular physical activity at 6 weeks and used behavioral processes of change more at 1 year
Whittemore 2009 [74]	Self-reported: nutrition and exercise level, depressive symptoms, satisfaction Objective: weight loss, waist circumference, insulin resistance, and lipid profiles	Significant trends or improvement in both groups for nutrition and exercise behavior. Participants of intervention group demonstrated trends for better high density lipoprotein (HDL) as well as exercise behavior. Twenty-five percent of lifestyle participants met treatment goals of 5% weight loss compared to 11% of standard care participants

Table 2.4 Effective communication related behavior change techniques (BCTs), combined and single (n=26 studies)

Communication-related BCTs/ number of studies:	Behavioral counseling	Feedback	Risk assessment	Education	Goal setting	Advice	Self-monitoring	Motivational interviewing	Cognitive behavior therapy
1				X		X			X
2	X					X			
1				X		X			
1				X	X	X	X		
1		X		X		X			
1		X		X	X	X			
2	X			X				X	
1	X		X						
6									X
10	X								
Total ^a	15/26	2/7	1/4	7/14	2/3	7/16	1/6	8/14	1/1

^a for example; behavioral counseling was 15 times used as effective technique out of a total of 26 times used as technique

Discussion and conclusion

Discussion

The present review shows that behavioral counseling, motivational interviewing, education and advice are most frequently evaluated as effective face-to-face communication-related BCTs. This overall conclusion could be drawn on the basis of finding relative many high quality studies in which communication-related BCTs prove to be effective. However, these techniques were also found in less successful studies due to differences in context, as design of the study and patient population, and to some extent the quality of the studies. Techniques such as feedback, risk-assessment, goal-setting and cognitive behavior therapy seem to be less effective, although the number of studies on these techniques was rather small.

Our findings are partly in line with other studies in the field of behavior change which suggest that simple advice is more effective to behavior change than intensive advice [95] and as effective as motivational interviewing [18]. However, other studies [24,26,96] suggest that advice and education are not effective, in contrast to more (intensive) patient-centred approaches. Our review did show that motivational interviewing (MI), which is considered a patient-centred approach [97], is also effective as BCT. Moreover, while MI is originally considered to be more a counseling style than a set of particular techniques [17], one can clearly describe MI as a set of techniques, containing the following elements: express empathy, develop discrepancy between present behavior and desired goals, avoid argumentation, roll with resistance and support self-efficacy [97,98]. In contrast, many of our included studies described the interventions and BCTs in general terms, like providing 'advice and education' or 'counseling sessions', which conceals underlying working mechanisms that may be crucial to the effectiveness of the BCT.

In line with others, we recommend future authors to describe the content of their interventions and BCTs more precisely [26,99-101]. According to Davidson and colleagues [101] among others [99], published articles should therefore include: (a) the content or elements of the intervention, (b) the characteristics of those delivering the intervention, (c) the characteristics of the recipients, (d) the setting, (e) the mode of delivery (e.g. face-to-face), (f) the intensity (e.g. contact time), (g) the duration (e.g. number of sessions over a given period), and (h) adherence to delivery protocols. Michie et al. [20] plead for the use of theory-based interventions to understand the causal

determinants of behavior change among other things. Our review demonstrates that no more than about half of the studies used a theory as basis for the intervention. However, sixteen out of the 26 effective studies described their theoretical foundation. Yet, these interventions were mostly theory-inspired instead of theory-based, i.e. the authors seldom linked (aspects of) the theory to the BCT used. Hence, next to the guidelines presented by Davidson et al. [101] a published article should also describe the theoretical basis of the intervention and BCTs used to get insight into the underlying working mechanisms [99,100]. Furthermore, we imagine that other elements are also of importance to be routinely reported e.g. amount of training and supervision of professionals, follow-up contacts and implementation fidelity.

We also found that physicians, nurses or a combination of these (sometimes in combination with other professionals) can provide effective face-to-face communication-related BCTs in primary care. Within primary care one profession (physician) does not seem to be better than the other (nurse) in providing face-to-face communication-related BCTs. However, we have to be cautious with this conclusion as we found only a few studies that included both physicians and nurses as health care providers. Since providing these BCTs can be time consuming for a single person or profession, an opportunity lies in dividing the workload or delegate certain tasks to another profession. Within this 'collaborative model of care' physicians provide care (e.g. provide diagnosis, screening, initiate treatment) and nurses deliver the counseling to patients (e.g. follow-up, support self-management) [55,102]. Therefore, proper task arrangements between physicians and nurses should be made. A recent study on cardiovascular prevention in the Netherlands did show that lifestyle intervention advice is in fact more frequently given by PNs than by GPs [28]. However, this study was based on self-reported information about lifestyle advice given, so we do not know if and how lifestyle is actually discussed in the consulting room. Future studies should therefore investigate how behavior change in lifestyle interventions is being discussed in the consulting room, both in quantity and content.

While population and public health approaches are widely used to change risk related to unhealthy lifestyle, governments more and more stress people's individual responsibility [103,104]. They claim that people can make their own decisions concerning lifestyle, although support and reliable information should be available to come to a conscious decision. This is

fairly in line with the principle of motivational interviewing, which focuses on the motivation of patients to change behavior instead of health care providers telling them what to do. Depending on the patients' motivational 'stage of change' a health care provider can offer specific information and advice to help a patient overcome resistance towards behavior change [105]. The finding that goal setting does not seem to be an effective technique deserves further attention in this respect.

Lastly, this review demonstrates a lack of knowledge about face-to-face communication-related BCTs; there is a lack of theoretical foundation of interventions and BCTs, diversity in intensity of interventions and the content of techniques. Besides, we do not know whether every BCT is actually applicable within primary care and for every patient. Although Abraham and Michie [99] provide a crucial first step by presenting a taxonomy of BCTs, as far as we know this taxonomy has not yet been used in interventions within behavior change research and techniques were only identified for HIV/AIDS, physical activity and healthy eating.

Strengths and limitations

This is the first review, to our knowledge, that examines physicians' and nurses' (working within primary care) provision of face-to-face communication-related BCTs to patients. Another strength of this review is that we only included studies with rigorous design (RCTs) that reported effects on actual patient behavior. Besides, our results were not dominated by large numbers of studies on a particular lifestyle behavior (e.g. smoking behavior); all lifestyle behaviors were addressed in relation to the (effective) BCTs. In addition, we specifically choose 'face-to-face' as form of delivery to avoid confounding with other modes of delivery.

Some limitations should also be noted. First, while we made an effort to create a thorough search strategy, it is possible that we failed to include all studies in this area due to publication bias and excluding non-English language studies. Second, in our quality assessment we relied on the methodology information that was reported in the articles. When information was missing we scored the item as 'unclear', without verifying this by contacting the authors of the sometimes relatively 'old' articles. When an article referred to another (not included) article for methodological information, we did, however, base our quality assessment on all available methodological information described in both articles. In addition, it is possible that the large amount of 'high quality' studies in this review is due

to our small adjustment of the number of quality criteria. Third, as mentioned before, the content of the interventions and BCTs were not always sufficiently described. Therefore, we could not report the underlying working mechanisms that may be critical to the effectiveness of the face-to-face communication-related BCTs. Also, this general description of the BCTs may suggest that when a technique is labeled as for example 'behavioral counseling' the content is always the same, while the technique could mean different things in different studies. Furthermore, we do not know whether the health care providers in the included studies delivered the face-to-face communication-related BCTs in a suitable and intended way, since this was not described. Besides, it was difficult to compare studies because of the different outcome measures they presented. However, it is still possible that some behaviors are more sensitive to BCTs than others. Lastly, although we only included studies with 'face-to-face' as form of delivery, it is possible that other elements of the intervention, for example providing medication or the intensity and duration of the intervention, also contributed to the outcomes of the BCT.

Conclusion

This review demonstrates that behavioral counseling, motivational interviewing, education and advice are all evaluated as effective communication-related BCTs. However, these BCTs were also found in less successful studies due to differences in context, as design of the study or patient population, and to some extent quality of the studies. Furthermore, based on existing literature, one primary care profession (physician) does not seem better equipped than the other (nurse) to provide face-to-face communication-related BCTs.

Practice implications

There is some evidence that behavioral counseling, motivational interviewing, education and advice can be used as effective communication-related BCTs by physicians and nurses. However, further research is needed to examine the underlying working mechanisms of communication-related BCTs, and whether they meet the requirements of patients and primary care providers. Observing real-life consultations between primary care professionals and patients can provide a first insight into the content and mechanisms of the communication-related BCT, used to intervene on patients' lifestyle behavior.

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3

Discussing patient's lifestyle choices in the consulting room: analysis of GP-patient consultations between 1975 and 2008

Noordman J, Verhaak P, van Dulmen S. Discussing patient's lifestyle choices in the consulting room: analysis of GP-patient consultations between 1975 and 2008. *BMC Family Practice* 2010;11:87.

Abstract

Background

The increasing prevalence of chronic diseases and the growing understanding that lifestyle behaviour plays an essential role in improving overall health suggest a need for increased attention to lifestyle choices in the consulting room.

This study aims to examine whether or not healthy and unhealthy lifestyle choices of patients are currently being discussed more often in primary care consultations than in former decades. Furthermore, we are interested in GPs' approach to lifestyle behaviour during consultations. Lastly, we examine whether lifestyle behaviour is discussed more with certain patients during consultations, depending on gender, age and educational background.

Method

We analysed video-recordings of medical consultations, collected between 1975 and 2008 in Dutch GP practices. Data were analysed using logistic regression.

Results

This study shows that discussion of smoking behaviour and physical activity has increased somewhat over time. A change in discussion of nutrition and alcohol is, however, less clear. Overall, alcohol use is the least discussed and physical activity the most discussed during consultations. GPs mainly refer to lifestyle when it is relevant to the patient's complaints (symptom approach). GPs' approach to lifestyle behaviour did not change over time. In general, lifestyle behaviour is discussed more with older, male patients (except for nutrition). GPs talk about lifestyle behaviour with patients from different educational backgrounds equally (except for physical activity).

Conclusion

In recent years there is greater awareness of a healthy lifestyle, which is reflected to a limited extent in this study. Still, lifestyle behaviour is discussed in only a minority of consultations. GPs do not refer to lifestyle behaviour as a routine procedure, i.e. do not include it in primary prevention. This highlights the importance of the introduction of prevention consultations, where GPs can discuss lifestyle issues with patients who do not (yet) have risk symptoms.

Background

Smoking, poor nutrition, alcohol abuse and physical inactivity are related to chronic diseases like heart and vascular disease, diabetes type II, Chronic Obstructive Pulmonary Disease (COPD), certain cancers and hypertension [1,2]. Changes in lifestyle, such as increased exercise, improved diet, lower alcohol consumption and non smoking can therefore improve overall health [3] and subjective well-being [4]. Governments and health service providers in many countries in the Western world recognize that advice on lifestyle risk factors is essential in the prevention of (chronic) diseases and the improvement of public health [5]. Especially in recent years there is greater awareness of improving lifestyle behaviour [6,7]. For example, in the Netherlands the government has developed a prevention bill, aimed at reducing the incidence of smoking, alcohol abuse, obesity, diabetes (type II) and depression [8,9].

General practitioners (GPs) play an important role in discussing lifestyle factors with their patients. Yet, previous research indicates room for improvement in both the frequency and quality of lifestyle advice given [10,11]. Common barriers for GPs to give advice about lifestyle are lack of confidence in its efficacy as well as a lack of time and financial incentives [12,13].

GPs tend to provide lifestyle advice mainly to patients who are at high risk or already have symptoms of certain diseases. A population approach, discussing lifestyle behaviour as a routine procedure, seems less common according to Swedish and UK research [14,15]. However, it is possible that these research findings do not apply to the situation in Dutch general practice, due to differences in health care systems and in policy on lifestyle behaviour. Furthermore, giving lifestyle advice to the patient is not within GP's task perception; GPs found it less relevant and appropriate than illness management [16]. Recent developments, such as the expected introduction of a prevention consultation and the use of practice nurses in primary care may generate a more pivotal and responsible position for the GP (and practice nurses) regarding patients' lifestyle behaviour [17]. The increasing prevalence of chronic diseases and the growing understanding that lifestyle behaviour plays an essential role in improving overall health [7,9] suggest a need for increased attention to lifestyle choices in the consulting room.

Unhealthy lifestyle behaviour clusters in certain groups. It has a higher prevalence in lower socio-economic groups [11,18,19], and there are

indications that it is age and gender-dependent. A previous study showed that male patients from the age of 50 had a healthier lifestyle and their behaviour changes were of more significance than male patients aged between 30 and 49 [20]. Another study found a higher prevalence of alcohol use, smoking and lower physical activity among male patients [21]. It is not clear whether GPs adapt the discussion of lifestyle behaviour to specific patient groups.

To explore whether or not healthy and unhealthy lifestyle is being discussed more often in recent primary care consultations, we analysed consultations between GPs and patients in the Netherlands recorded on video between 1975 and 2008.

In addition, we are interested in the kind of approach (population, high risk or symptom approach) taken by GPs in relation to lifestyle behaviour, whether a GP's approach to lifestyle behaviour changes over time and whether GPs adapt the discussion of lifestyle behaviour to specific patient groups. Three approaches were defined, based on a combination of literature findings [14,15] and our insights: 1. 'Population approach', GPs discuss lifestyle behaviour with all patients; 2. 'High risk approach', discussing lifestyle only with patients with (risk of) chronic diseases; and 3. 'Symptom approach', discussing lifestyle behaviour when it is relevant to the patient's presented symptom, without the patient being at high risk or having a chronic disease (for example asking about smoking habits if the patient is coughing).

To sum up, our research questions are:

1. How often is healthy and unhealthy behaviour of the patient (smoking, nutrition, alcohol consumption, and physical activity) discussed in GP consultations?
2. Has the frequency of discussing lifestyle during GP consultations changed over time?
3. Who takes the initiative (GP or patient) to discuss the patient's lifestyle behaviour? Has the initiative to discuss lifestyle behaviour changed over time?
4. What symptoms do patients show when lifestyle behaviour is discussed and to what extent do GPs use a 'population approach', 'high risk approach' or 'symptom approach' to discuss lifestyle behaviour? Has GPs' approach to discussing lifestyle behaviour changed over time?

5. Is lifestyle behaviour discussed more (or less) with certain patients during primary care consultations; depending on educational background, age group and/or gender?

Method

We used real-life videotaped GP-patient consultations to observe if and how often (un)healthy behaviour is discussed during consultations. Neither patients nor GPs were aware of the fact that the analysis would focus on communication about lifestyle behaviour. Video recording is an optimal method to observe GP-patient communication; the influence of the video recorder on the participants' behaviour is marginal [22].

Video-recordings were collected as part of eight different studies conducted by NIVEL (Netherlands Institute for Health Services Research): (1) in 1975 [23], (2) in 1977-1979 [24], (3) 1978-1980 [25], (4) 1982-1984 [26], (5) 1989 [27], (6) 1995-1996 [28], (7) 2000-2001 [29] and (8) 2007-2008 [30]. Table 3.1 describes the characteristics of patients and GPs who participated in the studies from 1975 until 2008. Over the years more female GPs participated in the studies. Other differences between the studies concern the number of participating patients and GPs and the representativeness of the samples. Some studies reflect Dutch GPs regarding practice form (solo, duo, group practice or health centre), age [29,30], sex [29], urbanicity and region [27, 29], while other studies represent a local [23,24] or random [25,26,28] sample of Dutch GPs. GP's response ranged between 21% in 1996 and 73% in 2001. Patients' response for the different studies ranged between 77% in 1989 and 88% in 2001.

The studies were carried out according to Dutch privacy legislation. The privacy regulation was approved by the Dutch Data Protection Authority. According to Dutch legislation, approval by a medical ethics committee was not required for these observational studies.

Table 3.1 Characteristics of GPs and patients in the observed consultations 1975-2008

	1975	1977-1979	1978-1980	1982-1984	1989	1995-1996	2000-2001	2007-2008
<i>Patients</i>	<i>n=214</i>	<i>n=345</i>	<i>n=363</i>	<i>n=1699</i>	<i>n=250</i>	<i>n=442</i>	<i>n=2082</i>	<i>n=808</i>
Age mean (SD)	41 (15)	39 (15)	44 (18)	40 (17)	36 (20)	41 (22)	43 (22)	43 (23)
Gender (%)	30% m 70% f	30% m 70% f	42% m 58% f	38% m 62% f	39% m 61% f	38% m 62% f	40% m 60% f	41% m 59% f
<i>GPs</i>	<i>n=10</i>	<i>n=9</i>	<i>n=10</i>	<i>n=30</i>	<i>n=17</i>	<i>n=32</i>	<i>n=155</i>	<i>n=40</i>
Gender (%)	100% m	100% m	100% m	97% m 3% f	76% m 24% f	48% m 52% f	77% m 23% f	65% m 35% f

Data collection

In all studies, an unmanned camera was installed for one or two random days in the consulting room of the GP concerned. Consecutive patients who had an appointment with the GP were approached by a researcher in the waiting room, who requested (written) informed consent and handed out the questionnaires. These questionnaires contained information about patients' characteristics (age, gender and educational background), their health, and the importance and performance scores they attribute to the communication with the GP. For some periods these questionnaires also contained additional questions: more detailed questions about health and use of care, opinions about referring and prescribing medication, preferences for care, social support, life events [27,29] preferences for their role in decision making, recall of information and medication adherence [30]. Educational background of the patient is used as a proxy for social economic status (SES).

Observations

The videotaped consultations were reviewed by two to six observers per study using an observation checklist, which was fairly similar for each time period. For each consultation the observers described whether the GP discussed (un)healthy behaviour of the patient in relation to smoking,

alcohol use, nutrition and physical activity (Yes/No). For the 2001 and 2008 studies we additionally took account of whose initiative (GP or patient) it was to discuss lifestyle. See Table 3.2 for transcribed video fragments showing whether the GP or patient takes the initiative to discuss lifestyle behaviour.

Furthermore, we registered the symptoms presented during the consultation. Symptoms were described according to the International Classification of Primary Care (ICPC). Since we are interested in the association between the patient's symptoms and the discussion of lifestyle behaviour with GPs, we selected consultations where the patient exhibited only one symptom. This was because when patients exhibited more than one symptom we could not directly relate these to the discussion of lifestyle behaviour. We used the patient's symptoms to identify GP's approach (population, high risk or symptom approach) to lifestyle behaviour.

Table 3.2 Video fragments in which the GP or patient takes the initiative to discuss lifestyle behaviour of the patient

1	<p>GP: How are you doing with the smoking? (<i>Initiative GP</i>)</p> <p>Pt: I'm not!.. smoking anymore.</p> <p>GP: Very good!</p>
2	<p>GP: So you are here for the blood pressure check. I see it's been a while.</p> <p>Pt: Yes it has. I'm working out now a lot... a lot! (<i>Initiative patient</i>)</p> <p>GP: You say a lot. Did you lose some weight as well?</p> <p>Pt: Yes, 33 pounds in total!</p> <p>GP: How much do you weigh now?</p> <p>Pt: Uhhh about 200 pounds.</p> <p>GP: Ok. It's quite a lot...losing 33 pounds I mean.</p> <p>Pt: Yes, with help from a dietician.</p> <p>GP: It doesn't matter how you do it! And what do you want to weight? What is your goal?</p> <p>Pt: I think 176 pounds would be nice. But now it is difficult.</p> <p>GP: Yes, the first pounds are easy, but well every pound counts. You should keep up the good work!</p>
3	<p>Pt: My throat hurts from coughing.</p> <p>GP: And you don't touch the cigarettes? (<i>Initiative GP</i>)</p> <p>Pt: No, because I have a fake cigarette now.</p> <p>GP: How is that working for you?</p> <p>Pt: I'll get used to it, although it is so heavy</p> <p>GP: But you do use it?</p> <p>Pt: Yes.</p> <p>GP: And no more cigarettes?</p> <p>Pt: Well, I'm finishing the last ones.</p> <p>GP: Ok. But it helps you when you smoke the fake cigarette?</p> <p>Pt: Yes, it's just like a normal cigarette, with smoke and everything.</p>

GP= General practitioner, Pt=patient

Interrater reliability

Observers were trained to observe the behaviours of GPs and patients during consultations in each time period. To compute reliability, 40 of the same consultations were observed by two observers. We calculated the interrater reliability between the observers with Cohen's kappa [31]. The interrater reliability is calculated for the 2007-2008 study. For the other periods (1975-2001) we could not calculate the interrater reliability for the categories of lifestyle behaviour since the different observers coded all different consultations regarding 'lifestyle behaviour'.

Statistical analyses

We compared smoking, alcohol use, nutrition and physical activity (as dichotomy variables) respectively during the eight periods (time series 1-8), using logistic regression. The time series were used as continuous variables, while correcting for the different periods between the time series. Next, we used 'time series' also as dummy variables (with time serie 1 as reference group) in logistic regression, to give more insight in the different periods when smoking, alcohol use, nutrition and physical activity are discussed (compared to the reference group). Differences in initiatives were analysed using T-test. Differences in patients' educational background, gender and age were analysed using logistic regression (with no formal education and male as reference groups; age was used as continues variable).

We performed analyses using Stata version 10 [32].

Results

Interrater reliability

For all the categories of lifestyle behaviour kappa is sufficiently reliable [31] (see Table 3.3).

Table 3.3 Interrater reliability 2007 - 2008, Cohen's kappa

	Kappa
Discussing lifestyle behaviour	
Smoking	0.79
Alcohol use	0.66
Nutrition	0.73
Physical activity	0.74

Discussing healthy and unhealthy lifestyle with the patient

Table 3.4 describes the percentage of consultations in which the GP discusses (un)healthy lifestyle behaviour with the patient and if the discussing of lifestyle changed over time.

Table 3.5 describes also the discussing of lifestyle over time, but with 1975 as reference year.

GPs discussed 'smoking behaviour' with the patient significantly more often during consultations in more recent years (time series 5-8) compared with previous years (time series 1-4). Smoking behaviour is discussed in 6.2 percent of the consultations on average.

It appears that the odds that GPs discuss smoking behaviour increase by a factor of 1.03 over time (95% CI 1.02-1.04). This means that for each additional year, there is a 3% increase in the odds of discussing smoking behaviour (Table 3.4). Table 3.5 shows that smoking behaviour is only significantly more often discussed during 1989 (time serie 5) compared to 1975 (time serie 1).

Alcohol use is discussed in 2.6 percent of the consultations. The odds that GPs discuss alcohol use increase by a factor of 1.02 over time (95% CI 1.01-1.04) (see Table 3.4). In contrast, Table 3.5 describes no significant difference over the years in discussing alcohol use (compared to 1975).

During 10.3 percent of GP-patient consultations nutrition is discussed. For each additional year there is a 2% increase in the likelihood of discussing nutrition (95% CI 1.01-1.03) (Table 3.4). Table 3.5 shows no significant difference over the years in discussing nutrition (compared to 1975).

Physical activity is discussed in 13.2 percent of consultations. The probability that GPs discuss physical activity increases by a factor of 1.06 over time (95% CI 1.06-1.07) (see Table 3.4). Table 3.5 describes that physical activity is significantly more discussed from 1989 until 2008 (time series 5-8) compared to 1975 (time serie 1).

Table 3.4 Percentage of consultations in which the GP discusses lifestyle choices with the patient, 1975-2008

Time series/ Behaviour	1975 (1) (n=214)	1977-1979 (2) (n=345)	1978-1980 (3) (n=363)	1982-1984 (4) (n=1699)	1989 (5) (n=250)	1995-1996 (6) (n=442)	2000-2001 (7) (n=2082)	2007-2008 (8) (n=808)	Overall
Smoking*	4.7 % CI: 1.8-7.5	2.3 % CI: 0.7-3.9	4.1 % CI: 2.1-6.2	4.1 % CI: 3.2-5.1	10.4 % CI: 6.6-14.2	7 % CI: 4.6-9.4	8.3 % CI: 7.1-9.5	8.3 % CI: 6.3-10.2	6.2 %
Alcohol use*	1.4 % CI: 0.0-2.9	1.4 % CI: 0.2-2.7	1.9 % CI: 0.5-3.3	2.0 % CI: 1.3-2.7	3.2 % CI: 1.0-5.4	4.3 % CI: 2.4-6.2	2.7 % CI: 2.0-3.4	3.5 % CI: 2.2-4.7	2.6 %
Nutrition*	8.8 % CI: 5.0-12.7	7.5 % CI: 4.7-10.3	10.5 % CI: 7.3-13.6	8.1 % CI: 6.8-9.4	10 % CI: 6.3-13.7	13.1 % CI: 10-16.3	13.3 % CI: 11.8-14.7	11.1 % CI: 9.0-13.3	10.3 %
Physical* activity	5.6 % CI: 2.5-8.7	5.2 % CI: 2.9-7.6	6.3 % CI: 3.8-8.9	8.4 % CI: 7.0-9.7	16.4 % CI: 11.8-21.0	13.1 % CI: 10-16.3	27.2 % CI: 25.3-29.1	23 % CI: 20.1-26.0	13.2 %

* Significant time trend: discussing of lifestyle behaviour increases over time, logistic regression (time series as continuous variable), Smoking= OR: 1.03 & CI: 1.02-1.04; Alcohol use= OR: 1.02 & CI: 1.01-1.04; Nutrition= OR: 1.02 & CI: 1.01-1.03; Physical activity= OR: 1.06 & CI: 1.06-1.07
OR= Odds Ratio, CI= 95% Confidence Interval

Table 3.5 Consultations in which the GP discusses lifestyle choices with the patient, 1975-2008, logistic regression (Odds Ratio & 95% Confidence Interval)

Time series/ Behaviour:	1975 (1) (n=214)	1977-1979 (2) (n=345)	1978-1980 (3) (n=363)	1982-1984 (4) (n=1699)	1989 (5) (n=250)	1995-1996 (6) (n=442)	2000-2001 (7) (n=2082)	2007-2008 (8) (n=808)
Smoking	Ref	OR: 0.5 CI: 0.2-1.2	OR: 0.9 CI: 0.4-2.0	OR: 0.9 CI: 0.4-1.7	OR: 2.4 CI: 1.1-5.1*	OR: 1.5 CI: 0.7-3.2	OR: 1.8 CI: 1.0-3.6	OR: 1.8 CI: 0.9-3.6
Alcohol use	Ref	OR: 1.03 CI: 0.2-4.4	OR: 1.4 CI: 0.4-5.4	OR: 1.4 CI: 0.4-4.7	OR: 2.3 CI: 0.6-8.9	OR: 3.1 CI: 0.9-10.8	OR: 2.0 CI: 0.6-6.4	OR: 2.5 CI: 0.8-8.4
Nutrition	Ref	OR: 0.8 CI: 0.5-1.6	OR: 1.2 CI: 0.7-2.2	OR: 0.9 CI: 0.5-1.5	OR: 1.1 CI: 0.6-2.1	OR: 1.6 CI: 0.9-2.7	OR: 1.6 CI: 1.0-2.6	OR: 1.3 CI: 0.8-2.2
Physical activity	Ref	OR: 0.9 CI: 0.4-2.0	OR: 1.1 CI: 0.6-2.3	OR: 1.5 CI: 0.8-2.8	OR: 3.3 CI: 1.7-6.5*	OR: 2.5 CI: 1.3-4.8*	OR: 6.3 CI: 3.5-11.4*	OR: 5.0 CI: 2.7-9.2*

Ref= reference group, OR=Odds Ratio, CI= Confidence Interval

* Significant difference ($P < 0.05$) compared to reference group (time serie 1), logistic regression (time series as dummy variables)

Initiative to discuss lifestyle

Table 3.6 describes who takes the initiative (GP or patient) to discuss lifestyle behaviour, during consultations in 2000-2001 and 2007-2008.

Only in a small proportion of the consultations GPs or patients take the initiative to discuss lifestyle behaviour. When lifestyle behaviour is discussed, GPs mostly take the initiative to discuss smoking behaviour and alcohol use. The initiative to discuss physical activity is more often taken by the patients themselves. There are no significant changes over time regarding the initiative to discuss lifestyle behaviour.

Table 3.6 Initiative to discuss lifestyle behaviour (consultation level)

Behaviour:	Discussed?	2000-2001	2007-2008
Smoking	Not discussed	91.7%	91.7%
	GP's initiative	6.0 %*	6.5%*
	Patient's initiative	2.3%	1.8%
Alcohol use	Not discussed	97.3%	96.5%
	GP's initiative	1.4%	2.1%*
	Patient's initiative	1.3%	1.4%
Nutrition	Not discussed	86.7%	88.9%
	GP's initiative	6.0%	5.4%
	Patient's initiative	7.3%	5.7%
Physical activity	Not discussed	72.8%	77%
	GP's initiative	9.8%*	9.4%
	Patient's initiative	17.4%	13.6%

*Significant difference between GP's initiative and Patient's initiative, T-test, $P(<0.05)$

Symptoms and approach to discussing lifestyle behaviour

Table 3.7 shows the symptoms for which lifestyle items (smoking, alcohol use, nutrition and physical activity) are discussed during a GP-patient consultation and GP's approach to patient's lifestyle behaviour. There were no significant differences in the kind of symptom (ICPC chapter) from 1975 until 2008 when discussing lifestyle items; therefore we make no distinction between the years.

Most of the patients had presented with respiratory complaints (in particular throat and breathing problems) when GPs provided advice on smoking behaviour, followed by 'general' complaints (mainly fatigue and medication

issues) and circulatory complaints (especially related to heart and vascular diseases and heart medication).

If GPs discuss alcohol use, patients tend to exhibit 'general' symptoms (in particular fatigue and medication issues), blood related symptoms (especially enlarged lymph node) and psychological symptoms (mainly drug misuse, stress and anxiety).

Table 3.7 Patient's symptom (ICPC) when the GP discusses smoking, alcohol use, nutrition and physical activity during a consultation, 1975-2008

Patient's symptom (ICPC- chapter)*	Smoking (n=172)	Alcohol use (n=62)	Nutrition (n=280)	Physical activity (n=491)
General	24 (14.0%)	12 (19.4%)	26 (9.3%)	38 (7.7%)
Blood	3	10 (16.1%)	4	3
Digestive	11	-	91 (32.5%)	16
Eye	2	-	-	3
Ear	-	-	5	13
Circulatory	19 (11%)	8	29 (10.4%)	22
Musculoskeletal	17	6	20	281 (57.2%)
Neurological	3	3	9	17
Psychological	9	11 (17.7%)	11	11
Respiratory	58 (33.7%)	2	22	33 (6.7%)
Skin	3	1	18	26
Metabolic, endocrine, nutrition	12	5	21	10
Urological	1	-	1	1
Pregnancy, family planning	6	4	8	4
Female genital	2	-	10	8
Male genital	1	-	2	1
Social problems	1	-	2	4

Table 3.7 - To be continued -

GP's approach to patient's lifestyle behaviour:	Smoking (n=172)	Alcohol use (n=62)	Nutrition (n=280)	Physical activity (n=491)
Symptom approach	134	45	251	407
High risk approach	38	17	29	84
Population approach**	-	-	-	-

*Consultations where the patients' show only one symptom (ICPC)

** A population approach is not visible since GPs discussed lifestyle behaviour only in a minority of the consultations

When GPs provide advice about nutrition to patients during a consultation, patients mainly have digestive complaints (in particular abdominal pains, stomach ache and diarrhoea), followed by circulatory complaints (especially hypertension and discussing heart research) and general complaints (mainly fatigue and fever). Most patients present with musculoskeletal complaints (especially back, knee and shoulder symptoms) when the GP discusses physical activity during a consultation. This is followed by general complaints (mainly fatigue and medication issues) and respiratory complaints (especially breathing problems and hyperventilation).

GPs in this study are shown to mainly use a 'symptom' approach to a patient's lifestyle behaviour. They discuss lifestyle behaviour when relevant to the patient's complaint; for example discussing nutrition when the patient has a stomach ache and smoking cessation when the patient has breathing problems. Lifestyle behaviour is also, to a small extent, discussed with patients at risk of or suffering from a chronic disease. An example of the 'high risk' approach in this study was the discussion of physical activity and nutrition with overweight patients and smoking behaviour with patients who have heart problems. The 'population approach' is not visible in this study, since lifestyle behaviour was only discussed in a minority of the consultations.

Educational background, age and gender of patients while lifestyle behaviour is discussed

Tables 3.8 and 3.9 show the educational background, age and gender of patients with whom lifestyle behaviour is discussed.

Table 3.8 Patients' educational background when lifestyle behaviour is discussed, 2000-2008

Discussing/ Educational background:	Smoking (n=189)	Alcohol (n=65)	Nutrition (n=270)	Physical activity (n=579)	Total
No formal education (ref)	14 (6%)	2 (0.9%)	29 (12.6%)	33 (14.3%)	231
Primary school	34 (7.1%)	8 (1.7%)	50 (10.4%)	102 (21.3%)	479
High school or vocational education	101 (7.4%)	38 (2.8%)	138 (10.2%)	301 (22.2%)	1358
College or university	33 (7.6%)	16 (3.7%)	42 (9.7%)	115 (26.6%)*	432

*Significant difference, logistic regression ('no formal education' as reference group), OR: 1.9 & CI: 1.2-3.1

GPs discuss smoking, alcohol and nutrition with patients from different educational backgrounds equally. GPs discuss physical activity significantly more with patients with a college or university degree compared to patients with no formal education.

Table 3.9 Patients' age and gender when lifestyle behaviour is discussed, 1975-2008

Discussing/ Age or gender category:	Smoking	Alcohol	Nutrition	Physical activity*	Total
0-19 years	30 (3.6%)	4 (0.5%)	108 (13%)	131 (15.8%)	831
20-44 years	165 (6.3%)	66 (2.5%)	237 (9%)	415 (15.8%)	2633
45-64 years	148 (8.6%)	65 (3.8%)	203 (11.8%)	308 (17.9%)	1722
65-74 years	40 (6.4%)	19 (3.1%)	74 (11.9%)	112 (18%)	622
75-84 years	15 (4.7%)	6 (1.9%)	42 (13%)	65 (20.2%)	322
> 85 years	2 (2.7%)	1 (1.4%)	5 (6.8%)	15 (20.3%)	74
Male (ref)	197 (8.2%)	102 (4.3%)	242 (10.1%)	466(19.5%)	2389
Female	203 (5.3%)**	79 (2.1%)**	426 (11.2%)	579 (15.2%)**	3808

*Significant trend: discussing of lifestyle behaviour increases when patient is older, logistic regression, OR: 1.01 & CI 1.01-1.01

**Significant difference, logistic regression (male as reference group), Smoking= OR: 0.6 & CI: 0.5-0.8; Alcohol=OR: 0.4 & CI: 0.3-0.5; Physical activity= OR: 0.7 & CI: 0.6-0.8

GPs discuss smoking and alcohol behaviour most with patients between 45 and 64 years of age. Nutrition is discussed equally with patients in all age categories.

The likelihood that GPs discuss physical activity increases with older patients (Odds ratio 1.01, 95% CI 1.01-1.01).

GPs discuss smoking, alcohol and physical activity significantly more with male than with female patients. Nutrition is discussed almost equally with male and female patients.

Discussion

This study is, to the best of our knowledge, the first to compare the frequency of discussing lifestyle behaviour during primary care consultations from 1975 until 2008. Our results demonstrate that smoking behaviour and physical activity were discussed somewhat more often during consultations in more recent years (especially since 1989). Whether nutrition and alcohol use are more often discussed over the years can not be confirmed.

It is possible that the increased policy attention for a healthy lifestyle of recent years has led to more awareness of and discussion about lifestyle habits in primary care consultations. Conceivably, the introduction of the Public Health Collective Prevention Act WCPV in 1989 in the Netherlands also focussed greater attention on a healthy lifestyle. This legislation supports the protection and promotion of public health for specific groups and it also promotes the prevention and early detection of diseases. In 2008, this law was replaced by the Public Health Act [33].

This study shows that overall physical activity was the most discussed and alcohol use the least discussed during primary care consultations. This is consistent with a previous Swedish study [14]. Besides, other research indicates that advice from GPs on alcohol behaviour is less common than advice about smoking, nutrition or exercise [34].

Although our results show that most lifestyle behaviours were discussed (somewhat) more in more recent years they still feature in only a minority of consultations. Theoretically, of course, it is possible that lifestyle behaviour had been discussed in a previous consultation to the one recorded, or the GP may have planned to broach it in a later consultation.

Our study also suggests that, although the initiative to discuss lifestyle behaviour is only taken by GPs and patients in a small proportion of the consultations, both take the initiative to discuss lifestyle behaviour. In the case of smoking cessation and alcohol use GPs are more likely to broach the subject, while patients bring up their physical activity behaviour more often during consultations.

In addition, our results show that GPs discuss lifestyle behaviour about smoking, alcohol and nutrition with patients from different educational backgrounds equally. GPs discuss physical activity even more with patients with a college or university degree compared to patients with no formal education. Apparently, the fact that unhealthy lifestyle has a higher prevalence in lower social economic groups does not result in more discussion about lifestyle behaviour with patients with a lower educational background during primary care consultations.

Furthermore, this study indicates that smoking behaviour, alcohol use and physical activity are more discussed with older, male patients. Nutrition, on the other hand, is discussed with almost as many male as female patients, from all age groups.

Additionally, our study demonstrates that GPs' approach to lifestyle behaviour did not change over time. Overall, it seems that GPs mostly use a 'symptom approach' to lifestyle advice; they discuss lifestyle behaviour when it is relevant for the patient's condition. For example, GPs discuss nutrition when the patient has a stomach ache and smoking cessation when the patient has breathing problems. Despite indications from previous research [14,15], GPs in our research did not focus on a 'high risk approach'. They discussed lifestyle behaviour with patients who were at risk or had a chronic disease, but this occurred not very often. Although it is possible that GPs who started with a 'symptom' to discuss lifestyle behaviour may have chosen to do this in those patients who are also at high risk.

A population approach to lifestyle advice is not visible in our consultations, since GPs discuss lifestyle behaviour with only a minority of their patients. This is in line with a previous study by Lawlor et al. [16], which also found that GPs do not take a population approach and are therefore unlikely to affect population health.

In the Netherlands, the UK and other western countries it is common that GPs delegate tasks, regarding patients with chronic diseases and their lifestyle, to practice nurses, nurse physicians or assistants [35, 36]. Although this form of task delegation is important to help chronically ill patients, these

professionals generally do not provide prevention advice to patients who do not yet have risk symptoms. An opportunity to tackle this problem lies in the introduction of prevention consultations in the Netherlands, performed by GPs, nurse physicians or practice nurses. The goal of the prevention consultation is to detect patients early who are at risk for conditions such as heart and vascular disease, diabetes or kidney disease. These are patients who are not (yet) at risk but during prevention consultations, they have the opportunity to discuss their lifestyle behaviour. The precise design of the prevention consultation is still under construction, but it will most likely be introduced during 2011 [17,37].

Strengths and limitations

A major strength of the present study is that we had access to data from video-recorded consultations between 1975 and 2008. Furthermore, observations are a more reliable source than self-reporting by GPs or patients, which could be biased. Besides, neither patients nor GPs were aware of the fact that the analysis would focus on communication about lifestyle behaviour.

Some limitations should also be noted. First, we did not examine the content of lifestyle behaviour during consultations. Therefore it was not possible to say anything about the quality of the discussion of lifestyle behaviour between GPs and patients. However, our data contains both simple (routine) questions about lifestyle behaviour (like 'do you smoke?') and extensive advice about lifestyle behaviour. Future research should investigate the content and quality of discussing lifestyle behaviour.

Second, observers who coded the discussion of 'physical activity' did not code physical activity primarily as a lifestyle topic. As a result, the frequency of discussion on physical activity also includes references to posture, exercise and sports in general. This could explain a higher frequency of discussion on physical activity for all years.

Furthermore, more female GPs participated in the later studies. We did not correct for this variable, since it is in line with the rising number of female GPs in the Netherlands in recent years [38]. As we do not know of any research indicating gender difference in discussing lifestyle factors, we do not expect that this increase of female GPs in more recent years has had any impact on our findings.

Although patients' response for the different studies was high (between 77% and 88%) and several studies show no difference between responders and

non-responders regarding age and gender [26,28,29], there are differences between responders and non-responders in other studies. In one study non-responders were somewhat older [30] and in two studies more female patients did not consent [24,30]. In some studies patients who did not consent showed also more psychological or social complaints [24,26] or female genital symptoms [28] than those who did consent.

Moreover, we were not aware of the present lifestyle behaviour of the patient, except when it was discussed during a consultation. Therefore, we could not exclusively select patients who were at high risk and in need of lifestyle advice. Furthermore, we did not identify consultations in which it was not appropriate to discuss lifestyle behaviour (such as palliative care or breaking bad news consultations). Further research could elaborate these issues.

In addition, an important limitation of our cross sectional design is the inability to attribute cause and effect. For example we state that unhealthy lifestyles are more prevalent in low SES groups but this does not result in more elaborate discussion of these issues. It is also possible that they are more prevalent because they are not discussed by the GP.

Lastly, previous research shows that the number of people with obesity is increasing over time [7,39], which could automatically lead to greater attention for physical activity during consultations, possibly weakening our findings about the increase in discussing physical activity over time. On the other hand, we may have underestimated the effect of discussing smoking behaviour with patients during consultations since the number of smokers has declined in recent years [40] and our results show an increase in discussing smoking behaviour.

Conclusion

In recent years there is greater awareness of a healthy lifestyle, which is reflected to a small extent in the higher frequencies of discussing smoking and physical activity behaviour over time. It is less clear whether or not nutrition and alcohol use are also more often discussed in recent years. Moreover, lifestyle choices (especially about alcohol use) are still discussed in only a minority of consultations. GPs mainly discuss lifestyle behaviour when relevant to the patient's condition and do not discuss lifestyle behaviour as a routine procedure i.e. do not use it for primary prevention. Moreover, our study showed that GPs' approach to lifestyle behaviour did not change over time. These findings highlight the importance of

introducing prevention consultations, which will enable people who do not (yet) have risk symptoms to discuss their lifestyle behaviour.

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4

Exploring lifestyle counselling in routine primary care consultations; the professionals' role

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Abstract

Background

It is generally acknowledged that general practitioners (GPs) and practice nurses (PNs) may significantly contribute to a patient's healthy lifestyle behaviour. Two counselling techniques are known to strengthen this process: tailoring information and advice about lifestyle behaviour to a patient, and motivational interviewing (MI). It is not clear to what extent GPs and PNs actually apply these techniques during routine consultations.

Objectives

To examine how GPs and PNs discuss patients' lifestyle behaviour, in terms of the level of tailoring of information and advice, and their application of Motivational Interviewing.

Methods

We randomly videotaped GP-patient and PN-patient consultations within Dutch general practices and selected 124 and 141 consultations, respectively, that included any discussion about the patient's lifestyle. These were analysed, using the 'Behaviour Change Counselling Index' (BECCI), level of tailoring and content of lifestyle counselling.

Results

Information about lifestyle is mainly given in generic terms by GPs and PNs. In contrast, advice about smoking behaviour more often seems to be tailored to the patient. GPs hardly ever applied MI in their consultations about patient's lifestyle behaviour. PNs trained in MI, did apply this technique, but also to some extent only.

Conclusion

Both GPs and PNs somehow perform lifestyle counselling according to generally acknowledged criteria. However, for both, there is room for improvement in the application of MI skills and in tailoring of information and advice about lifestyle behaviour. Effort needs to be put into integrating such techniques into busy daily practice while simultaneously complying with the many other clinical demands.

Introduction

The global burden of chronic diseases and related pivotal role of healthy lifestyle behaviour require both preventive and managing strategies [1,2]. In primary health care, the general practitioner (GP) and the practice nurse (PN) can significantly influence patient's lifestyle behaviour by identifying a patient's unhealthy behaviour and by counselling accordingly [3,4]. The context of primary care seems suitable, since changing lifestyle behaviour demands regular contacts [5] and a considerable part of the general population visits the GP or PN at least once a year [6,7]. Generally, GPs diagnose and initiate treatments and lifestyle counselling, whereas PNs monitor treatment outcome, provide education and support for behaviour change, and offer follow-up contacts [8]. Consequently, they both have (partly different) responsibilities in managing lifestyle issues [9].

Information and advice about lifestyle behaviour should preferably be 'tailored' to a patient [10,11], by adapting information and advice to individual characteristics related to outcomes of interest [10]. Tailored interactions are acknowledged to be more relevant than generic communication for health behaviour change [10,11]. Besides, patient's information recall is enhanced when tailored to their specific situation [12]. To what extent GPs and PNs actually tailor their information and advice about lifestyle behaviour is as yet unknown.

Several studies show that motivational interviewing (MI) is a promising, tailored strategy to assist GPs and nurses in achieving behaviour change in their patients [13,14]. MI focuses on resolving ambivalence between a patient's desired and actual behaviour and centres on motivational processes that could facilitate change [15]. However, PNs often refrain from putting MI skills into practice [16,17]. Whether the same applies to GPs remains to be seen.

The aim of the present study is to examine *how* GPs and PNs perform lifestyle counselling during routine consultations, in terms of the level of tailoring of information and advice, and their application of Motivational Interviewing. A qualification of the extent to which patient's lifestyle behaviour is discussed during routine consultations of GPs and PNs is not part of this study. Also, we do not want to suggest that the lifestyle counselling performed by GPs and PNs is comparable.

Methods

Recruitment of professionals

Video-recordings were made of GP-patient and PN-patient consultations as part of: (1) the GP-patient communication study in 2007-2008 [18] and (2) the PN-patient communication study in 2010-2011 [19].

GPs participating in study (1) are all members of the Netherlands Information Network of General Practice (LINH), a representative network of 84 general practices and more than 330000 patients [20]. A sample of 93 GPs was drawn from LINH of which 40 GPs (44%) from 20 practices agreed to participate in the video observation study [18]. These 40 GPs represent the Dutch GP regarding gender and practice form, but were on average 4 years older than the average Dutch GP.

The participating GPs from study (1), and GPs from one other practice, were contacted for participation of their PNs in study (2); ten PNs from seven practices agreed to participate (47% response rate; six practices did not employ a PN). Another health care centre contacted us for participation of their ten PNs. This resulted in 20 PNs in total, of which one stopped working during our study and is therefore left out. Consequently, 19 PNs participated. In the Netherlands, between 3700 and 4700 PNs are working within 3482 general practices in 2011 [21].

Recruitment of patients and procedure

The GPs agreed to have approximately twenty consecutive, everyday consultations videotaped. The recording with an unmanned digital camera took place on one or two random days, resulting in a total of 808 recorded consultations. 77.6% of the patients agreed to participate. Non-responders were somewhat older (on average 48 year versus 43 year) and less often female.

The PNs agreed to have approximately ten consecutive, everyday consultations videotaped during one or two random days, resulting in 181 recorded consultations. 92.8% of the patients agreed to participate. Non-responders did not differ from participants regarding gender.

All participating GPs, PNs and patients filled in an informed consent form before the recording of the consultation. Participants could withdraw their consent at any time; no one did. Pre-consultation, patients completed a questionnaire about their sociodemographic characteristics and their

complaint or disease. Patients from PNs also answered questions about smoking and physical activity.

All PNs were trained in MI as part of their education, thirteen also received additional postgraduate MI training. To our knowledge, only one GP was MI-trained.

Video-recorded GP-patient consultations were selected in which patient's (un)healthy lifestyle behaviour (smoking, physical activity, alcohol use or dietary behaviour) was discussed. In case of smoking and physical activity, consultations were only selected if the patient mentioned that he/she smoked, and/or had a physical activity level under the Dutch guideline of 30 minutes a day, five days a week [22]. For alcohol use and dietary behaviour we included all consultations in which these behaviours were discussed. This resulted in the selection of 124 video-recorded consultations (15%) between 124 patients and 39 GPs. One of the 40 GPs did not discuss lifestyle in any of his consultations.

Video-recorded PN-patient consultations were selected in which patient's (un)healthy lifestyle behaviour (smoking, physical activity, alcohol use or dietary behaviour) was discussed. Consultations were only included if patients had indicated in the questionnaire that they smoked or reported a physical activity level under the Dutch guideline [22]. In total, 141 video-recorded consultations (78%) between 141 patients and 19 PNs were selected. Included patients were all 18 years or older.

Analyses

The videotaped consultations were coded using Observer software [23] by two observers independently, using: (1) The psychometrically sound Behaviour Change Counselling Index (BECCI) [24-26] (Appendix 4) to code Motivational Interview (MI) skills, and (2) a self-developed lifestyle behaviour protocol, to rate the volume and level (generic or tailored) of the discussion of patients' lifestyle behaviour (Appendix 5).

The BECCI contains eleven, five-point Likert-scaled items related to providers' MI techniques, ranging from 'not at all' to 'a great extent', subdivided into four domains. Because of low to moderate Cronbach's alpha scores for the BECCI domains, the eleven separate items of the BECCI were also analysed.

To observe the interaction about patient's lifestyle behaviour we developed four items, related to the health care providers' behaviour: (1) providing verbal information about lifestyle behaviour, (2) providing verbal advice

about lifestyle behaviour, (3) referring the patient (e.g. to a dietician), and (4) providing a leaflet or printed material (e.g. about healthy nutrition). These items were only coded when present and could be coded several times during a consultation, for one or more lifestyle behaviours. In case GPs or PNs provided information or advice, we categorized these as 'generic' or 'tailored'. Generic information or advice is defined as information or advice strictly according to Dutch guidelines (for example on diabetes type 2 or the 'stop smoking' guideline) and not aimed at a specific person [10]. 'Tailored' is defined as information or advice adapted to a person's individual characteristics related to the outcome of interest (Appendix 5) [10]. In case tailoring was found in a consultation, no matter of the extent of the tailoring in the consultation, a consultation was scored as 'tailored'. See Appendix 5 for examples of generic and tailored information and advice.

In conformity with MEDICODE [27], an observation protocol for assessing communication about medicines, the initiative (professional or patient) to discuss lifestyle behaviour and its length (in minutes/seconds) were also coded.

Furthermore, we registered the disease/symptoms presented in GP-patient consultations, according to the International Classification of Primary Care (ICPC). The symptoms/disease of patients who visited the PN was derived from the PN questionnaire; PNs described patient's perceived complaints and diseases as registered in their medical record for that day.

To assess interrater reliability, a random 10 percent of the consultations were rated by both observers, resulting in sufficiently high average Kappa scores of 0.82 (range 0.40-1.00) for the BECCI and 0.89 (range 0.66-1.00) for discussing lifestyle behaviour of the patient.

Statistical analysis

Descriptive analyses were performed using Stata 11.

Results

Patient characteristics

Table 4.1 describes the patient characteristics. GPs and PNs see different patient groups. GPs see patients with a wide range of diseases and complaints, while patients who visit the PN are mostly diagnosed with a chronic disease or present one or more risk factors (e.g. obesity).

Table 4.1 Characteristics of patients visiting the general practitioner (N=124) or the practice nurse (N=141)

	Patients of general practitioners (N = 124)	Patients of practice nurses (N = 141)
Mean age in years (SD; range)	49.8 (15.6; 19-84)*	61.3 (13.3; 19-85)
Men (%)	44 %	50%
Educational level (%)		
low	15%	28%
middle	49%	53%
high	24%	15%
'missing'	12%	4%
Dutch ethnicity (%)	78%	81%
Western	5%	9%
Non-western	4%	9%
'missing'	13%	1%
Smoking; daily/now and then (%)	n.a.	33%
Meets recommended physical exercise (%)	n.a.	49%**
Disease/ risk factor/ICPC-chapter*** (n=)	<i>ICPC chapter</i> General: 7 Blood: 2 Digestive: 11 Eye: 2 Ear: 2 Circulatory: 13 Musculoskeletal: 27 Neurological: 6 Psychological: 11 Respiratory: 14 Skin: 7 Metabolic, endocrine, nutrition: 9 Urological: 1 Pregnancy, family planning: 4 Female genital: 6 Male genital: 1 <i>Unclear/unknown: 1</i>	<i>Disease/risk factor</i> Diabetes type 2: 69 Asthma/COPD: 21 Heart & vascular disease: 2 Hypertension: 34 High cholesterol: 2 Other (e.g. smoking): 12 <i>Unclear/unknown: 1</i>

*n=1 missing, **n=3 missing, n. a.= not available

***only the first (most important) complaint/disease (ICPC-code) of a patient is provided

Lifestyle counselling by general practitioners

During the routine GP consultations, physical activity (61%), smoking (46%) and/or dietary habits (43%) were most often discussed. Alcohol use was discussed in a minority of the consultations (19%). The mean duration of lifestyle talk ranged from 0.28 minutes for alcohol use to 1.29 minutes for dietary habits (see Table 4.2). GPs mostly took the initiative to discuss smoking behaviour.

Table 4.2 Communication between GPs (N=39) and patients (N=124) about patient's lifestyle behaviour during real-life consultations (N=124)

	Smoking	Alcohol	Physical activity	Dietary habits
Number of consultations (% total N= 124)	57 (46%)	23 (19%)	76 (61%)	53 (43%)
Duration of lifestyle talk Mean (range)	1.28 min (0.01-7.87)	0.28 min (0.02-0.73)	1.26 min (0.08 -5.38)	1.29 min (0.09-4.19)
<i>Initiative</i>				
GP	77%	48%	43%	43%
Patient	23%	52%	53%	55%
Both	-	-	4%	2%
<i>Information</i>				
	22 consultations	8 consultations	22 consultations	18 consultations
Generic	15	8	16	17
Tailored	7	-	6	1
<i>Advice</i>				
	4 consultations	1 consultation	17 consultations	15 consultations
Generic	1	1	9	10
Tailored	3	-	8	5
Supply folder	none	none	1 time	3 times

GPs' information about lifestyle behaviour was mainly generic (Table 4.2). For example, 'GP: Smoking, no matter how much, influences your lung condition. Patient: Yes, that is right' (see also Appendix 5). Information and advice about alcohol use ($n=9$) were always provided in generic terms, whereas most advices about smoking behaviour ($n=4$) were tailored. Advice about physical activity ($n=17$) was almost as often generic as tailored. The GPs referred five patients to a dietician, one patient to a physiotherapist and

one patient for physical activity support. Folders about lifestyle behaviour were given four times.

Table 4.3 shows GPs' application of MI skills. On average, GPs applied MI minimally. When examining the separate BECCI items, GPs regularly 'demonstrate sensitivity to talking about other issues' (item 2) and they 'use summaries to bring together what the patient says about the topic' (item 7) to some extent.

Table 4.3 Mean and standard deviation BECCI-domain scores of general practitioners and practice nurses

	Mean scores (SD) of general practitioners (N=39), during 124 consultations	Mean scores (SD) of practice nurses (N=19), during 141 consultations	Cronbach's alpha scores for BECCI domains
<i>Domain 1 Agenda setting and permission seeking</i>	1.81 (0.51)	2.27 (0.55)	$\alpha=0.54$ by PNs $\alpha=0.26$ by GPs
1. Practitioner invites the patient to talk about behaviour change	0.74 (0.90)	1.72 (0.79)	
2. Practitioner demonstrates sensitivity to talking about other issues	2.88 (0.66)	2.82 (0.50)	
<i>Domain 2 The why and how of change in behaviour</i>	1.27 (0.71)	1.73 (0.63)	$\alpha=0.66$ by PNs $\alpha=0.62$ by GPs
3. Practitioner encourages the patient to talk about current behaviour or status quo	1.54 (1.19)	2.91 (0.49)	
4. Practitioner encourages the patient to talk about behaviour change	0.82 (1.13)	2.00 (1.05)	
5. Practitioner asks questions to elicit how the patient thinks and feels about the topic	0.86 (1.19)	1.72 (1.10)	
6. Practitioner uses empathic statements when the patient talks about the topic	1.02 (1.09)	0.84 (1.04)	
7. Practitioner uses summaries to bring together what the patient says about the topic	2.11 (1.08)	1.17 (0.99)	

Table 4.3 - To be continued -

	Mean scores (SD) of general practitioners (N=39), during 124 consultations	Mean scores (SD) of practice nurses (N=19), during 141 consultations	Cronbach's alpha scores for BECCI domains
<i>Domain 3 The whole consultation</i>	0.82 (0.72)	2.28 (0.75)	$\alpha=0.69$ by PNs $\alpha=0.59$ by GPs
8. Practitioner acknowledges challenges about behaviour change that the patient faces	0.48 (0.87)	1.21 (1.19)	
9. When practitioner provides information, it is sensitive to the patient concerns and understanding	1.23 (1.07)	3.31 (0.83)	
10. Practitioner actively conveys respect for the patient choice about behaviour change	0.73 (0.98)	2.30 (0.81)	
<i>Domain 4 Talk about targets</i>	0.51 (0.86)	2.02 (0.83)	
11. Practitioner and the patient exchange ideas about how the patient could change current behaviour			-
BECCI mean sum score	1.10 (0.48)	2.07 (0.56)	-

Note. Scale of the domains:

0 = Not at all, 1 = Minimally, 2 = To some extent, 3 = A good deal, 4 = A great extent

Lifestyle counselling by practice nurses

During PNs' routine consultations, physical activity (in 84% of the consultations) and dietary habits (80%) were most often discussed, followed by smoking (51%) and alcohol use (36%). The mean duration of lifestyle talk was highest for smoking and dietary habits (both 2.5 minutes on average), a visit about smoking could take up to 29 minutes (Table 4.4).

PNs mainly took the initiative to discuss smoking, alcohol and physical activity behaviour and, to a smaller extent, dietary behaviour.

When PNs provided information about lifestyle behaviour this was mainly done in a generic way. Advice about lifestyle behaviour was usually tailored (see Table 4.4). An example of PN's tailored advice; 'PN: And do you walk or bike? Patient: Yes, I walk the dog, but that is only a ten minutes' walk, or say fifteen minutes, that's it. PN: Yes, yes, well that's hard then. Are there

other possibilities? During your break? Or can you extend the walk with your dog, that would also be helpful. (see Appendix 5 for more examples).

PNs referred, under supervision of their GP, seven patients to a dietician and one patient for physical activity support. PNs also made an appointment with one patient for telephone support and with five patients a follow-up appointment about lifestyle behaviour. Folders were provided 15 times, of which ten folders about healthy eating.

Table 4.3 shows PNs' application of MI skills. In general, PNs applied MI skills to some extent. The PNs regularly 'provide information which is sensitive to the patient concerns and understanding' (item 9), 'encourage patients to talk about current behaviour or status quo' (item 3) and 'demonstrate sensitivity to talking about other issues' (item 2).

Table 4.4 Communication between practice nurses (N=19) and patients (N=141) about patient's lifestyle behaviour during real-life consultations (N=141)

	Smoking	Alcohol	Physical activity	Dietary habits
Number of consultations (% total N=141)	72 (51%)	51 (36%)	118 (84%)	113 (80%)
Duration of lifestyle talk Mean (range)	2.50 min. (0.01 – 29.76 min.)	1.04 min. (0.01 – 17.37 min.)	1.36 min. (0.03 – 6.55 min.)	2.50 min. (0.01 – 13.43 min.)
<i>Initiative</i>				
Practice nurse	83%	67%	64%	54%
Patient	14%	31%	24%	24%
Both	3%	2%	12%	22%
<i>Information</i>				
Generic	13	12	27	52
Tailored	6	1	8	14
<i>Advice</i>				
Generic	3	1	9	14
Tailored	5	3	17	16
Supply folder	4 times	none	1 time	10 times

Conclusion and discussion

Given the different patient samples and standard consultation time, the consultations of GPs and PNs cannot simply be compared. Therefore, we describe the outcomes on GPs and PNs skills separately. However, practice implications or suggestions for improvement are applicable for both.

Our results demonstrate that GPs and PNs do perform lifestyle counselling. However, there is room for improvement. GPs and PNs mainly provide generic information about lifestyle behaviour instead of adjusting the information to the specific situation of a patient. Overall, few patients were given advice about their lifestyle behaviour. When PNs did provide lifestyle advice, they did this most often in a tailored way. GPs delivered both generic and tailored advice. It was expected that information about lifestyle would mainly be provided in generic terms, in contrast to advice about lifestyle behaviour that, preferably, should be tailored. This was found to be the case for PNs, although they gave only few advices. Previous research shows that tailored interactions are more relevant than generic communication for health behaviour change, in helping patients to become and continue to be motivated, obtain new skills and perform and maintain desired lifestyle changes [10,11]. Furthermore, 'alcohol use' was not as often discussed as smoking behaviour, physical activity and dietary habits. This is in line with results from a study among Swedish GPs, which also found that alcohol use was least often discussed [28].

GPs' and PNs' application of MI skills could also be improved, although there is no 'golden standard' for applying MI. GPs showed on average a minimal application of MI in their consultations, whereas trained PNs applied MI skills to some extent during their consultations about patient's lifestyle behaviour.

During PNs' consultations, PNs more often initiated the discussion of lifestyle behaviour. This could be explained by differences in patient samples and standard consultation time of GPs and PNs. The fact that PNs devote more time to discussing lifestyle behaviour is consistent with their task description and was also found previously [9]. However, the average time that GPs and PNs devote on discussing lifestyle behaviour is very short, especially given the complexity of this topic. When GPs and PNs discuss patient's lifestyle for less than a minute they could, for example, only check a patient's current lifestyle or compliment a patient with his/her behaviour. As far as we know, there is no research indicating how many

minutes of lifestyle counseling are necessary to achieve (and maintain) behavior change. However, a recent study on diabetes patients receiving face-to-face lifestyle counseling suggests that more frequent lifestyle counseling (i.e. at least once a month) results in better outcomes [29].

A strength of our study is that GPs, PNs and patients were not aware of the fact that our observations focused on communication about lifestyle behaviour. However, PNs did know that their MI skills were evaluated, in contrast to GPs. Furthermore, we analysed routine GP and PN consultations instead of focussing on specific patient populations and as such our results do represent the actual daily situation in general practice. Besides, as far as we know, this is the first study in which PNs' lifestyle counseling is analyzed (in terms of information and advice), and lifestyle counseling by GPs and PNs is integrated into one article.

Some limitations should also be mentioned. First, the studies took place in different time periods. Consultations of GPs were recorded in 2007-2008 and consultations of PNs in 2010-2011. This could have influenced our outcomes. However, to our knowledge, no policy changes with respect to discussing a patient's lifestyle behaviour were effectuated between 2007 and 2011. Second, PNs were all MI trained and 13 PNs received extra post-education training in MI [19], while all but one GP were untrained in MI. Therefore the results on MI skills of PNs and GPs are not comparable and should be interpreted with caution. Third, our study describes *how* GPs and PNs perform lifestyle counselling. The *extent* to which they perform lifestyle counselling in daily practice was not part of our research. Furthermore, given potentially different patient samples and standard consultation time (10 versus 20 minutes per patient), GPs and PNs performances cannot simply be compared. However, those differences do mirror standard everyday care. PNs receive (or create) a patient population with mostly chronic ill patients or patients with risk factors who potentially benefit from lifestyle interventions, whereas lifestyle counselling forms only a part of the workload of GPs.

Therefore, although not part of our research, it was expected that GPs perform less lifestyle counselling than PNs [9]. Previous research among GPs shows that GPs perform lifestyle counselling on average in 2.6% (discussing alcohol use) to 13.2% (discussing physical activity) of their consultations [18], somewhat less than the 15% we found in this study. Furthermore, PNs are nested under GPs. Because of the small-scale nature of

this study we were not able to take the nesting structure into account. Additionally, one item of the BECCI (“Practitioner asks questions to elicit how the patient thinks and feels about the topic”) for GPs’ consultations was not coded reliable (Kappa of 0.40). The outcome on this item should therefore be treated with caution. Fortunately, all other items of the BECCI and lifestyle protocol showed substantial to high interrater agreement. Furthermore, the selection procedures were somewhat different for GPs and PNs. The patients in the GP group were not asked to fill in a questionnaire about their current lifestyle behavior. Therefore, we had to rely on what was discussed during the GP consultations. Consequently, we could have underestimated the amount of patients from the GP group that needed lifestyle counseling. Besides, we could not determine whether or not the sample of PNs was representative for the Dutch population of PNs. Lastly, we could not compare the age of the non-responders in the PN-patient study with the age of the participants in this study, because only few non-responders provided their age.

Despite these limitations, this study offers a valuable overview of how lifestyle counselling is performed in routine consultations of GPs and PNs. Future research should focus on how to integrate both tailored information and advice about lifestyle behaviour and MI in routine primary care consultations of GPs and PNs, while simultaneously complying with the many other clinical demands.

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Ethical approval: The studies were carried out according to Dutch privacy legislation. The privacy regulations were approved by the Dutch Data Protection Authority. According to Dutch legislation, approval by a medical ethics committee was not required for these observational studies.

Conflict of interest: None.

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5

Do trained practice nurses apply motivational interviewing techniques in primary care consultations?

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Abstract

Background and aim

Reducing the prevalence of unhealthy lifestyle behaviour could positively influence health. Motivational interviewing (MI) is used to promote change in unhealthy lifestyle behaviour as part of primary or secondary prevention. Whether MI is actually applied as taught is unknown. Practice nurses' application of motivational interviewing in real-life primary care consultations were examined. Furthermore, we explored if (and to what extent) practice nurses adjust their motivational interviewing skills to primary versus secondary prevention.

Methods

Thirteen Dutch practice nurses, from four general practices, trained in motivational interviewing participated. 117 adult patients visiting the practice nurse participated.

117 practice nurse-patient consultations between June and December 2010 were videotaped. Motivational interview skills were rated by two observers using the Behaviour Change Counselling Index (BECCI). Data were analyzed using multilevel regression.

Results

Practice nurses use motivational interviewing techniques to some extent. Substantial variation was found between motivational interviewing items. No significant differences in the use of motivational interviewing between primary and secondary prevention was found.

Conclusions

Motivational interviewing skills are not easily applicable in routine practice. Health care providers who want to acquire motivational interview skills should follow booster sessions after the first training. The training could be strengthened by video-feedback and feedback based on participating observation. A possible explanation for the lack of differences between the two types of prevention consultations may be the gain to help patients in primary consultations by preventing complications equals the necessity to help the disease from aggravating in secondary prevention.

Introduction

The World Health Organization advocates the integration of strategies to prevent and manage lifestyle-related chronic conditions in primary health care [1]. Primary health care is a suitable context to identify and address behavioral risk factors [2-4] since utilisation by the general population is high [5,6]. Furthermore, interventions aimed at behavioral change often require regular health care contacts [4]. Even though the community added value of primary care preventive activities is generally accepted and broadly advocated, the quality of the actual delivery process during everyday healthcare visits is usually taken for granted, and implementation checks are scarce.

The majority of preventive activities in primary care are delivered by a physician or general practitioner (GP). Generally, GPs make the initial diagnosis, initiate the treatment and facilitate overall continuity of care [7]. Yet, discussing lifestyle and referring to programmes promoting lifestyle can be well performed by a practice nurse (PN) [8-10]. Previous research shows that PNs monitor patients with chronic conditions such as type 2 diabetes [11], provide patients with lifestyle advice and guide them during smoking cessation and weight reduction [12]. The level of professional autonomy of nurses varies both within and across countries, but is generally high [13].

Due to GP's lack of time, PNs might be even more suitable for promoting healthy lifestyles than GPs [14,15]. As PNs spend more time on counseling patients than GPs [16,17], they may be more oriented towards counseling and other behavioral techniques of importance for the prevention of lifestyle-related chronic conditions.

In the USA, the UK, and beyond, promising results have been reported in changing an unhealthy lifestyle using motivational interviewing (MI) techniques [18-20]. MI is a patient-centered directive approach to enhance intrinsic motivation to behavioral change by helping patients explore and resolve ambivalence between desired behavior and actual behavior [21,22]. It focuses on what patients can do to improve their health, as opposed to health care providers telling them what to do. MI has shown to produce positive health behavior change and maintenance [23]. However, there are other behavior change approaches that show similar positive health outcomes [24,25].

Previous research into MI has focused predominantly on determining whether or not MI is more effective for changing behavior than other

interventions [6,26,27]. Little is, however, known about the actual use of MI techniques in everyday consultations in general or by PNs specifically [28-30].

The aim of the present study is to assess whether PNs apply MI techniques in consultations and if (and to what extent) they adjust their MI skills to primary or secondary prevention of lifestyle-related diseases. A primary prevention consultation aims to prevent the development of a chronic disease such as heart and vascular disease, type 2 Diabetes Mellitus and Chronic Obstructive Pulmonary Disease (COPD), and therefore focuses mainly on avoiding health risks. Secondary prevention consultations focus on people already affected by a chronic disease and attempt to enhance the patient's autonomy, minimize the consequences of the disease and prevent the disease from aggravating. It may be important to distinguish between these two types of prevention consultations as they may require different communication strategies; in primary prevention, PNs may need more time and effort to motivate the patient compared to secondary prevention which may also be reflected in longer visits.

Materials and methods

The study has an observational design; real-life consultations between PNs and patients within primary care were observed.

Participants

Thirteen PNs from four practices trained in MI participated. All PNs from three practices were approached by contacting the GPs of these practices, who (except for one practice) participated in an earlier study [31]. GPs from one other practice (health care center) contacted us for participation of all of their PNs. PN's prior MI training varied between 1/2 day to six half days. On average PNs had four years of working experience (SD: 2.47, range: 9 months - 9 years and 11 months).

Adult patients scheduled for an appointment with the PN between June and December 2010 were eligible for inclusion. We included approximately ten patients per PN.

Procedure

Consecutive consultations were videoed using an unmanned digital camera located unobtrusively in the PN's consulting room for one or two random days. The aim was to record ten routine consultations per PN. All the participating PNs provided care to a mixed group of patients e.g. with type 2 diabetes, COPD (secondary prevention), or high risk patients (primary prevention) with e.g. hypertension, counseling on smoking. Discussing patient's lifestyle behavior was a potential component of the consultations, which a PN or patient could bring up.

Patients were approached by a researcher in the waiting room. They were asked to give written informed consent and to complete a short questionnaire about sociodemographics and lifestyle behaviors (smoking, alcohol use and physical activity).

This study was performed according to Dutch privacy legislation. The privacy regulation was approved by the Dutch Data Protection Authority. According to Dutch legislation, approval by a medical ethics committee was not required for this observational study.

Observations and reliability

The videotaped consultations were rated by two observers independently. For each consultation the application of MI was coded, using the Behaviour Change Counselling Index (BECCI) checklist [32,33]. The BECCI contains eleven, five-point Likert-scaled items related to the practitioners' behaviors and MI techniques, ranging from 'not at all' to 'a great extent' (see Appendix 4). These items are subdivided into four domains: agenda setting and permission seeking (two items, Cronbach's $\alpha=0.61$); the why and how of change in behavior (five items, $\alpha=0.70$); the whole consultation (three items, $\alpha=0.69$); and talk about targets (one item).

Additionally, as part of BECCI, PNs' speaking time is assessed with a separate item. In line with MI, a practitioner is expected to talk no more than 50% of the consultation time. Therefore, speaking time is divided into 'consultation with PNs' speaking time half of the time or less' versus 'more than half of the time'. In previous research, BECCI has demonstrated acceptable levels of reliability, validity and sensitivity to detect change [33-35]. To assess interrater reliability, 21 consultations were rated by both observers, resulting in a sufficiently high average Kappa score [36] of 0.81 (range 0.72-1.00).

Statistical analysis

First, characteristics of the patients in the two prevention groups were calculated. Differences between the groups were tested using independent t-test for continuous variables and chi-square test for dichotomous and categorical variables. Second, the average scores for the separate BECCI-domains, the BECCI total, speaking time and consultation length are compared between the two groups with an independent t-test and a chi-square test. Third, multilevel linear regression analyses with a random intercept were performed to determine the association between the four domain scores of the BECCI, BECCI total score and consultation length (dependent variables) with the types of prevention consultations (model 1). This means that we created a separated model for every dependent variable with the type of prevention consultation. The multilevel technique was used to correct for clustering of patients within PNs [37]. Thereafter, model 1 (for every dependent variable) was corrected for confounding in two steps. Firstly, patients' social demographic characteristics - age, gender, marital status, educational background and ethnicity - were added to the model (model 2). Secondly, patients risk factors - smoking, alcohol use and physical activity - were added to model 2 (model 3). Interaction terms were added to model 3 to test for potential effect modification.

Finally, the association between the speaking time of the PN and the types of prevention consultations was analyzed with multilevel logistic regression analyses with a random intercept using the second order PQL method (model 1). Due to the low number of patients in the primary prevention group (n=39), this association could only be corrected for age and gender (model 2). The analyses were performed in Stata 11 (www.stata.com) and MLwiN [38].

Results

Subjects

117 consultations were analyzed; 78 were secondary prevention consultations, of which 58 with patients with type 2 diabetes, and 39 were aimed at primary prevention, e.g. hypertension (n=18), high cholesterol (n=2), impaired glucose tolerance (n=4) or combinations of these. Patient's non-response rate was 6 %. We excluded four patients receiving Cardiovascular Risk Management (CVRM) because CVRM-consultation can

be classified as a primary as well as a secondary prevention consultation at the same time. The characteristics of the two groups are depicted in Table 5.1.

Table 5.1 Baseline characteristics of the patients in both groups

	Primary prevention n = 39	Secondary prevention n = 78	P-value
Mean age in years (SD; range)	64.2 (12.1; range: 38.0 -84.6)	64.5 (11.9; range: 29.4 - 86.2)	0.90
Men (%)	43.6	47.4	0.69
Educational level (%)			0.16
low	22.2	36.5	
middle	69.4	50.0	
high	8.3	13.5	
Married/living together (%)	83.3	71.4	0.17
Dutch ethnicity (%)	89.7	84.2	0.42
Smoking: daily/now and then (%)	26.3	28.4	0.82
Alcohol use; daily/now and then (%)	76.3*	52.7*	0.02
Meets recommended physical exercise (%)	61.1	56.2	0.62

* Significant difference between primary prevention and secondary prevention, χ^2 test, ($P < 0.05$)

The application of MI techniques

Table 5.2 shows the average scores on the separate BECCI-domains, BECCI mean sum score, speaking time and consultation length. PNs scored highest in Domain 1, with an average score of 2.2. The underlying item about inviting the patient to talk about behavior change had a mean score of 1.5, the item 'demonstrating sensitivity to talking about other issues' had a mean score of 2.8. The participating PNs tend to give patients a choice in what to talk about, but they scored low on asking patients about their willingness to talk about their behavior.

Domain 2 showed the lowest average score of 1.7. The underlying item about encouraging the patient to talk about current behavior or status quo had an average score of 2.8. This suggests that PNs regularly ask open questions and/or use empathic listening statements, but fail to meet the other four items belonging to domain 2 (notably: the lack of using empathic statements when the patient talks about the topic averaged 0.8).

Domain 3 had a mean score of 2.0. The average score of 3.1 for the item about providing information which is sensitive to patient's concerns and understanding is high compared to the item 'acknowledges challenges about behavior change that the patient faces' (mean 0.9). PNs try to understand what the patient knows and wants to know, but focus insufficiently on the personal strengths of the patient while facing behavioral changes. In line with BECCI, practitioners should talk no more than 50% of the time. In 18% of the consultations PNs talked more than 50% of the time. The duration of consultations varied between 4.6 minutes and 46.7 minutes, with a mean duration of 22.5 minutes (sd=10.02). There is a significant relationship between the consultation length and PNs use of MI techniques. However, the effects ($r = 0.02$) are very small (results of regression coefficients not shown).

Table 5.2 Mean and standard deviation BECCI-domains, BECCI mean sum score, consultation length and speaking time (%) in both groups

	Primary and secondary prevention n = 117 Mean (SD)	Primary prevention n = 39 Mean (SD)	Secondary prevention n = 78 Mean (SD)	P-value*
<i>Domain 1 Agenda setting and permission seeking</i>	2.2 (0.63)	2.2 (0.55)	2.2 (0.67)	0.80
1. Practitioner invites the patient to talk about behavior change	1.5 (0.91)	1.5 (0.82)	1.6 (0.95)	0.83
2. Practitioner demonstrates sensitivity to talking about other issues	2.8 (0.57)	2.8 (0.52)	2.8 (0.60)	0.82
<i>Domain 2 The why and how of change in behavior</i>	1.7 (0.65)	1.7 (0.54)	1.6 (0.70)	0.86
3. Practitioner encourages the patient to talk about current behavior or status quo	2.8 (0.62)	2.8 (0.51)	2.7 (0.67)	0.53
4. Practitioner encourages the patient to talk about behavior change	1.8 (1.10)	2.0 (1.09)	1.7 (1.10)	0.15

Table 5.2 - To be continued -

	Primary and secondary prevention n = 117 Mean (SD)	Primary prevention n = 39 Mean (SD)	Secondary prevention n = 78 Mean (SD)	P-value*
5. Practitioner asks questions to elicit how the patient thinks and feels about the topic	1.6 (1.10)	1.6 (1.09)	1.6 (1.11)	0.81
6. Practitioner uses empathic statements when the patient talks about the topic	0.8 (1.07)	0.7 (0.93)	0.9 (1.13)	0.50
7. Practitioner uses summaries to bring together what the patient says about the topic	1.3 (1.00)	1.2 (0.79)	1.4 (1.09)	0.36
<i>Domain 3 The whole consultation</i>	<i>2.0 (0.73)</i>	<i>2.1 (0.69)</i>	<i>2.0 (0.75)</i>	<i>0.34</i>
8. Practitioner acknowledges challenges about behavior change that the patient faces	0.9 (1.11)	0.9 (1.07)	0.8 (1.14)	0.62
9. When practitioner provides information, it is sensitive to the patient concerns and understanding	3.1 (0.81)	3.2 (0.70)	3.1 (0.87)	0.64
10. Practitioner actively conveys respect for the patient choice about behavior change	2.1 (0.86)	2.3 (0.86)	2.0 (0.85)	0.19
<i>Domain 4: Talk about targets</i>	<i>1.9 (0.81)</i>	<i>2.0 (0.82)</i>	<i>1.9 (0.80)</i>	<i>0.38</i>
11. Practitioner and the patient exchange ideas about how the patient could change current behavior	1.9 (0.81)	2.0 (0.82)	1.9 (0.80)	0.38
BECCI mean sum score	1.9 (0.60)	2.0 (0.52)	1.9 (0.63)	0.57
Consultation length (minutes)	22.1 (10.02)	21.0 (9.25)	22.5 (10.40)	0.41
Consultations with PN speaking time half of the time or less (%)	82.0	84.6	80.8	0.61

Note: Scale of the domains: 0 = Not at all, 1 = Minimally, 2 = To some extent, 3 = A good deal, 4 = A great extent. *No significant difference between primary prevention and secondary prevention, T test, ($P < 0.05$).

Table 5.3 presents the results of the multilevel analyses with MI techniques and consultation length as dependent variables and the two types of prevention consultations as independent variables.

These analyses reveal no significant differences between the two types of prevention consultations (model 1), even after correcting for sociodemographics, smoking, alcohol use and physical activity (model 2,3). None of the interaction terms added to model 3 were statistically significant (results of interaction analyses not shown). The regression coefficients are depicted in Table 5.3. The non-significant coefficients range from -0.03 to -0.23. Hence, differences between the groups are small. After adjustment for sociodemographics and self-reported current lifestyle behavior the coefficients hardly change. The unexplained variance on practice nurse level (highest level) ranged from 0.044 to 0.066 for Domain 1 (model 1,3,2), from 0.066 to 0.80 for Domain 2, from 0.052 to 0.086 for Domain 3, from 0.081 to 0.138 for Domain 4, from 0.052 to 0.084 for BECCI mean sum score and from 30.02 to 32.62 for the consultation length. The intraclass correlation (ICC) on the four BECCI domains and BECCI mean sum score ranged from 0.10 to 0.15 for model 1.

Our results show no significant association between the type of consultation and speaking time (odds ratio = 1.3; 95% CI = 0.5-3.7). The unexplained variance on practice nurse level ranged from 1.336 to 1.542 (model 1&2) for speaking time. The ICC on speaking time is 0.29 for model 1.

Table 5.3 Regression coefficients of the type of prevention consultation on the various domains, the BECCI mean sum score and consultation length

	Model 1: regression coefficient (95%CI)	Model 2 (demographic characteristics): regression coefficient (95%CI)	Model 3 (demographic characteristics + risk factors): regression coefficient (95%CI)
Domain 1 Agenda setting and permission seeking	0.11 (-0.26 – 0.29)	0.08 (-0.26 – 0.28)	0.11 (-0.26 – 0.29)
Domain 2 The why and how of change in behavior	0.02 (-0.28 – 0.28)	-0.03 (-0.28 – 0.27)	0.02 (-0.28 – 0.28)
Domain 3 The whole consultation	-0.12 (-0.33 – 0.30)	-0.16 (-0.32 – 0.27)	-0.08 (-0.30 – 0.27)
Domain 4 Talk about targets	-0.18 (-0.37 – 0.31)	-0.23 (-0.36 – 0.28)	-0.18 (-0.36 – 0.30)
BECCI mean sum score	-0.05 (-0.26 – 0.25)	-0.09 (-0.25 – 0.23)	-0.04 (-0.25 – 0.24)
Consultation length	0.71 (-2.51 – 5.38)	0.33 (-3.34 – 4.69)	1.04 (-1.95 – 6.30)

Note: 17 cases were excluded due to missing data

Discussion

This study is, as far as we know, the first to examine whether and how PNs apply MI techniques in real-life primary care consultations and if they adjust their MI skills to the type of prevention consultation. PNs do appear to apply MI techniques, but only to a moderate level. This is in line with previous findings suggesting that MI skills are not easily applicable in daily practice. Heinrich [28] found a limited use of MI, Voogdt-Pruis [39] concluded that within cardiovascular prevention PNs should pay more attention to MI and Efraimsson and colleagues [40] demonstrated that nurses rarely used MI techniques in their smoking cessation communication with patients. In the present study, differences in the use of MI techniques may also be due to differences in the content and extensiveness of training in MI which all PNs went through.

As mentioned before, we found that PNs use MI techniques with substantial variation between the four domains. PNs demonstrate sensitivity to talking about other issues than behavior change, encourage the patient to talk about current behavior or status quo and are sensitive to the patients' concerns and understanding when providing information. In contrast, PNs particularly fail to meet the use of empathic statements when the patient talks about behavior change, often forget to summarize what the patient says, to ask patients about their willingness to talk about their behavior and do not always acknowledge the challenges of behavior change. Furthermore, although the majority of the PNs meet the required MI speaking time, in about one sixth of the consultations PNs talked more than half of the time.

No differences were found in the use of MI between primary and secondary prevention consultations. The gain to help patients in primary consultations by preventing complications may equal the necessity to help the disease from aggravating in secondary prevention, both requiring MI. If so, MI has relevance for primary and secondary consultations.

Our definition of primary and secondary prevention consultations is in line with previous studies [39,41,42]. In research on prevention, however, other definitions of primary and secondary prevention are also used. For example, Saxena, Jane-Llopis and Hosman [43] among others [44], distinguish primary, secondary and tertiary prevention in which secondary and tertiary prevention overlap with our primary and secondary prevention, respectively. To avoid ambiguity regarding the opposite or sometimes

overlapping definitions of primary and secondary prevention, we plea for a more universal nomenclature.

Strengths and limitations

Our results are based on observational data instead of self-reported data only. Another major strength is that consecutive patients were approached and recruited during a regular visit to their PN and were not selected for any type of condition. Moreover, patients were not notified in advance about the study and when asked for participation in the waiting room, only 6% refused to participate. We thus got a realistic insight into the application of behavioral change techniques in usual daily practice.

There are also some limitations. First, the length of the MI training differed substantially between PNs. Post-hoc analysis did not reveal a positive influence of the length of the training. Our observations show a limited use of MI techniques. But, some BECCI-items are only completed when it is applicable within the context. MI focuses on resolving ambivalence between desired behavior and actual behavior and on enhancing intrinsic motivation to behavioral change. When medical parameters show normal levels or patient's lifestyle appears healthy, some MI techniques may be redundant. Furthermore, although there is evidence for the effectiveness of MI there are many other approaches to behavior change that show equally effective outcomes [24,25]. Besides, motivation is only one of a range of factors influencing behavior [24].

Implications for future research and clinical practice

In conformity with previous studies [28,45,46], our study suggests that training is not enough for acquiring MI skills. Teaching of MI techniques has been shown before to influence practitioner's behavior [30,45,47], but many practitioners tend to return to old counselling habits after a few months [24,45,46]. Though additional training might strengthen and maintain the new counseling skills, training needs to focus on enhancing new counseling behavior consistent with MI and suppressing old counseling behavior that is inconsistent with MI [28]. Furthermore, all members of a medical practice need to be motivated to change and to have a shared understanding of the meaning of an approach [46]. Besides, it is important that health care providers are supported by their supervisor [48] and colleagues [30,34]. We suggest that health care providers, like PNs, who want to acquire MI skills follow an extensive training with sufficient follow-up. Besides continuing

education, the training could be extended by video-feedback [31] and feedback based on participating observation.

Lastly, an explanation for the insufficient MI use may be that the PNs also have to (prove to) adhere to clinical guidelines at the same time [39,49]. It is possible that PNs find it hard to combine these guidelines with MI. Clinical practice guidelines demand PNs to meet certain task requirements, but PNs also want to take the patients' motivation into account as part of MI. This may be contradictory. Future research could investigate this hypothesis.

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6

Motivational Interviewing within the different Stages of Change: an analysis of practice nurse-patient consultations aimed at promoting a healthier lifestyle

Noordman J, de Vet E, van der Weijden T, van Dulmen S. Motivational Interviewing within the different Stages of Change: an analysis of practice nurse-patient consultations aimed at promoting a healthier lifestyle. Accepted for publication in *Social Science & Medicine*.

Abstract

Combining the Stages of Change model (SOC) with Motivational Interviewing (MI) is seen as a helpful strategy for health care providers to guide patients in changing unhealthy lifestyle behaviour. SOC suggests that people are at different stages of motivational readiness for engaging in health behaviours and that intervention methods are most useful when tailored to a person's stage of change. However, it is unknown whether practice nurses (PNs) actually adapt their MI and more generic communication skills to a particular stage during real-life face-to-face consultations with their patients. The aim of this study was to explore whether and how PNs apply MI and general communication skills to the different SOC of patients, targeting behaviour change about smoking, alcohol use, dietary habits and/or physical activity.

Real-life consultations between nineteen Dutch PNs and 103 patients were recorded on video between June 2010 and March 2011. All consultations focused on a discussion of patients' lifestyle behaviour. The Behaviour Change Counselling Index (BECCI) was used to code PNs' MI skills. Generic communication skills were rated with the MAAS-global. Patients' SOC was assessed for each consultation by observing the communication between patient and PN regarding the patient's current lifestyle behaviour.

Multilevel analyses revealed that PNs adapt their MI skills to a patient's SOC to some extent. On average PNs apply MI skills more to patients in the preparation stage ($P < 0.05$) than during the other stages of change. PNs adjusted three MI skills and one generic communication skill to patients' SOC. This explorative study suggests that, at least to some extent, PNs intuitively assess the stage of patients' readiness to change and tailor their communication accordingly. However, differences between the stages were small. By teaching PNs to explicitly identify patients' SOC they could further enhance and adapt their MI and general communication skills to the individual.

Introduction

Primary health care is seen as an appropriate setting for the prevention and management of a patient's lifestyle behaviour [1-3]. In primary care, addressing lifestyle behaviour and referring to programmes promoting lifestyle can generally be carried out by a practice nurse (PN). Previous studies indeed show that PNs adequately monitor patients with chronic conditions, provide patients with lifestyle advice and guide them during smoking cessation and weight reduction [4,5].

Most primary care providers rely on their (authoritative) professional role to convince people to change by providing information or advice about behaviour change, although the effectiveness of these methods are ambiguous [6-9]. Such a traditional persuasive approach does not do justice to the complex nature of changing lifestyle behaviour (i.e. smoking, alcohol use, dietary habits or physical inactivity). Health behaviour change requires effort, motivation and time from both patients and health care providers. At the same time, patients are often ambivalent about behaviour change [6,10] and have variable levels of motivation over the course of time [11]. A more promising approach to changing unhealthy behaviour is motivational interviewing (MI) [12-14]. MI is a patient-centred directive approach to enhance intrinsic motivation to behavioural change by helping patients explore and resolve ambivalence between the desired behaviour and their actual behaviour [15,16]. It focuses on what patients can do to improve their own health, as opposed to health care providers telling them what to do.

Since patients have varying levels of motivation over time [11], combining MI with the Stages Of Change (SOC) construct from Prochaska & DiClemente's Transtheoretical Model is seen as a possible potentially helpful strategy to help patients change their behaviour [9,11,17,18]. According to the SOC, individuals are at different stages of motivational readiness for engaging in health behaviours, and intervention methods (i.e. interpersonal communication) are most useful when they are tailored to a person's current stage of motivational readiness. The core organizing principle of the Transtheoretical Model is the SOC construct, which represents a temporal dimension and distinguishes five stages of change indicating individuals' predispositions to change: precontemplation (no intention to change behaviour within the next 6 months), contemplation (intention to change behaviour within the next 6 months, but does not act on intention to change behaviour), preparation (intention to change behaviour within 30 days),

action (people changed from unhealthy to healthy behaviour within the past 6 months), and maintenance (maintenance of the behaviour change for more than 6 months) [8,18-21]. Progression between the stages is not linear and patients may move forward and backward. Individuals in the various stages differ with respect to the stimuli and barriers they experience in the process of health behaviour change. In other words, the factors and processes hindering or facilitating behaviour change are assumed to differ in each specific stage of change. Hence, patients are assumed to benefit most if health care providers adapt their communication to the individual's SOC [8,18,22]. However, there are studies that indicate that the Transtheoretical Model or SOC construct is not beneficial in changing behaviour [23].

Although the idea that communication should be tailored to individuals (stage of change) is widely acknowledged, it remains unknown whether PNs actually adapt *their* MI and/or more generic communication strategies to a particular SOC during real-life face-to-face consultations with their patients. The aim of the present study is to explore if and to what extent PNs apply MI techniques and general communication skills (including clinical competence) during the different SOC for patients, with emphasis on targeting behaviour change about smoking, alcohol use, dietary habits and/or physical activity.

We hypothesize that PNs are more likely to invite and encourage the patient to talk about behaviour change during a patient's precontemplation and contemplation stage, than during the other SOC. This is also true more for during the preparation stage than during the action and maintenance stage. This can be seen as what is described as 'consciousness raising' [20], even though theoretically patients in the precontemplation stage benefit most from 'consciousness raising' [20]. In addition, we expect that PNs are more likely 'to ask questions to elicit how the patient thinks and feels about behaviour change' during the precontemplation and contemplation stage than during the other stages. This is reasonably in accordance with the principle of 'dramatic relief' [20]. However, in theory, patients in the precontemplation stage benefit most from 'dramatic relief' [20]. Furthermore, we expect that PNs are more likely 'to acknowledge challenges about behaviour change that the patient faces' during the patient's preparation stage, or during the action and maintenance stage, rather than in the precontemplation or contemplation stage, since these are stages where the patient is ready to change or is already changing. Besides, we

hypothesize that PNs and patients are more likely to exchange ideas about how the patient could change current behaviour during the preparation stage than during the other SOC, since patients in the preparation stage show willingness to change behaviour. Finally, we expect that PNs' clinical competence, i.e. their ability to adhere to relevant practice guidelines, will be performed independent of patient's SOC. We had no preconceived ideas concerning the generic communication skills of PNs in relation to patient's SOC since there is no published literature on this topic.

Method

Participants and procedure

Nineteen Dutch PNs from eight general practices participated in this study and agreed to have approximately ten consecutive, routine consultations videotaped between June 2010 and March 2011. General practices were located throughout The Netherlands. All PNs from seven practices were approached by contacting the GPs from these practices who (except for one practice) had participated in an earlier study [24]. GPs from one other practice (a health care centre) contacted us for inclusion of all of their PNs. On average PNs had 4.5 years of working experience (SD= 2.79). All nineteen PNs were trained in MI as part of their education, and thirteen of the PNs had undergone extra post-education training in MI [25].

Consultations were video-taped with an unmanned camera located in the consulting room during one or two random days. Adult patients who were scheduled for an appointment with the PN were approached beforehand by a researcher in the waiting room (n= 181, excluding non-response 7.7%). All participating PNs and patients filled in an informed consent form before recording of the consultation. Participants could withdraw their consent at any time; no one did. Before the recording of the consultation, patients were asked to fill in a questionnaire about their sociodemographic characteristics (e.g. age, gender), the reason for their consultation and their current lifestyle behaviour (smoking, physical activity).

PNs completed a short questionnaire after each recorded consultation. This questionnaire contained information about patients' characteristics (e.g. age, gender) and perceived complaints and diseases. The study was carried out according to Dutch privacy legislation. The privacy regulations were approved by the Dutch Data Protection Authority. According to Dutch

legislation, approval by a medical ethics committee was not required for this observational study.

Selection of patients and discussion of lifestyle behaviour

Patients were selected who indicated in the patient questionnaire that they smoked or reported a medium intensive physical activity level of less than 30 minutes a day, five days a week, according to Dutch guidelines [26,27]. A second selection criterion was that the lifestyle behaviour (smoking, physical activity, alcohol use or dietary behaviour) of the included patients was discussed during the video-recorded consultation. In total, video-recorded consultations of 149 patients were selected, of which 103 consultations were analysed. Forty-six consultations were not included because lifestyle behaviour was not discussed (even though patients smoked or did not meet the recommended level of physical activity, n=16) or because the patient's SOC could not be coded reliably (n=30).

Video-observations

The videotaped consultations were rated using two protocols: (1) the MAAS-global [28] and (2) the Behaviour Change Counselling Index (BECCI) [29,30]. Observer software [31] was used to code the video-recorded consultations; items of the observation protocols were incorporated in Observer.

The MAAS-global, a validated instrument [28], was used to rate PNs' generic communication and clinical competence. This protocol is divided into three sections (see Appendix 6): communication skills for each separate consultation phase (from introduction until evaluation of the consultation), general communication skills (e.g. exploration, information giving) and medical aspects (compliance with guidelines). Each item is to be rated on a scale ranging from 0 'not present' to 6 'excellent'.

The BECCI checklist [29,30] was used to code the application of MI for each consultation. The BECCI contains eleven, five-point Likert-scaled items related to the health care providers' behaviours and MI techniques, ranging from 'not at all' to 'a great extent' (see Appendix 4). These items are subdivided into four domains: agenda setting and permission seeking (two items, Cronbach's $\alpha=0.49$); the why and how of change in behaviour (five items, $\alpha=0.60$); the whole consultation (three items, $\alpha=0.60$); and talk about targets (one item). In previous research, BECCI has demonstrated acceptable levels of reliability, validity and sensitivity to detect change [30,32,33].

Owing to low to moderate Cronbach's alpha scores for the BECCI domains in this study, the eleven separate items of the BECCI were also analysed.

In addition we observed the patient's stage of change (SOC) for each consultation by identifying the patient's current lifestyle behaviour through the communication interaction between patient and PN. The definitions of the five different stages of change were in line with Prochaska & DiClemente's [19,20] SOC model (see introduction). When a patient presented multiple unhealthy behaviours during one consultation we selected one behaviour for which we defined the SOC: (1) the behaviour for the SOC which became most evident during the consultation, and if multiple behaviours still remained (2) the behaviour for which acting upon change was, at that moment, most profitable (e.g. the most earliest SOC level), as indicated during the consultation.

To assess interrater reliability, ten percent of the consultations were rated by two observers independently, resulting in sufficiently high average Kappa scores [34] of 0.81 (range 0.72-1.00) for the BECCI, 0.82 (range 0.54-1.00) for the MAAS-global and total agreement for SOC (Kappa score of 1.00).

Statistical analysis

Firstly, characteristics of PNs, and patients within their stages of change were described and tested with a Chi2 test for categorical variables or an Anova for continuous variables. To explore the interrelationships between all communication items and constructs, we computed Pearson correlation coefficients. We clustered the stages of precontemplation and contemplation into one category, and did the same for action and maintenance, since only few people were in the precontemplation (n=8) and maintenance (n=3) stage. This resulted in three (combined) stages of change; (1) precontemplation and contemplation (n=47), (2) preparation (n=22), and (3) action and maintenance (n=34).

Secondly multilevel linear and logistic regression analyses with a random intercept were performed to determine the association between the MAAS-global scores, BECCI domain scores and separate BECCI items (dependent variables) with the different stages of change (model 1).

The multilevel technique was used to correct for clustering of patients within PNs [35]. The categories of SOC (e.g. 0 =not (pre-)contemplation and 1 =(pre)contemplation) were coded as dummy variables. Thereafter, model 1 was corrected for confounding. Patients' characteristics (age, gender, lifestyle behaviour) were added to the model (model 2). For every

dependent variable (e.g. BECCI domain 1) a separate model was created (model 1 and 2) with the different stages of change (e.g. preparation) in order to avoid multiple testing. The analyses were performed in Stata 11 [36] using *xtmixed* for multilevel linear regression (BECCI domains; BECCI mean sum score; BECCI items 1-5,8-11; MAAS-global items 2,4-6,8,10-17) and *gllamm* [37] for multilevel logistic regression (BECCI items 6,7; MAAS-global items 1,3,7,9). In case of multilevel logistic regression dependent variables were coded as dummies (e.g. 0=No Emotions and 1=Emotions).

Results

Participants

A total of 103 consultations between PNs (n=19) and patients (n=103) were analysed. All nineteen PNs were female with a mean age of 42 years (SD: 5.6). Patients' characteristics and their lifestyle behaviour are described within their SOC in Table 6.1. Only one significant difference was found between the patients' SOC: more patients are still in the (pre)contemplation or preparation phase for smoking behaviour.

At the moment of the video-recorded consultation 45.7 percent of all patients were in the precontemplation or contemplation stage, 21.4 percent were in the preparation stage and 32.9 percent were in the action or maintenance stage. The significant correlations between the different SOC are medium to strong (range -0.37 – -0.64).

Table 6.1 Characteristics of patients (n=103) within their (observed) stage of change

	Patients in the pre-contemplation or contemplation stage n= 47	Patients in the preparation stage n= 22	Patients in the action or maintenance stage n= 34	P-value
Mean age in years (SD)	58.2 (14.7)	61.4 (10.8)	61.8 (12.6)	0.41
Men (%)	64	41	44	0.10
Educational level (%)				
low	29.6	35.0	30.3	0.96
middle	56.8	45.0	48.5	
high	13.6	20.0	21.2	

Table 6.1 - To be continued -

	Patients in the pre-contemplation or contemplation stage n= 47	Patients in the preparation stage n= 22	Patients in the action or maintenance stage n= 34	P-value
Married/living together (%)	76	71	73	0.84
Dutch ethnicity (%)	85	82	79	0.53
Smoking; daily/now and then, according to patients (%) ^b	51	41	24	0.04a
Meets recommended physical activity level, according to patients (%) ^b	52	52	41	0.58
Mean consultation length (minutes)	24.5	23.9	22.7	0.45
Disease/ risk factor (%):				0.41
Diabetes type 2	44.7	40.9	58.8	
COPD/ asthma	17.0	13.6	5.9	
Heart & vascular disease	4.3	-	-	
Hypertension	25.5	27.3	23.5	
Other	8.5	18.2	11.8	

^a Significant difference between the stages of change, χ^2 ($P < 0.05$)

^b Patient's (un)healthy lifestyle behaviour does not always correspond with the observed stage of change. It is possible that a patient who meets the recommended level of physical activity (action or maintenance stage) also smokes and has no intention to change this smoking behaviour, and is therefore selected as a patient in the precontemplation stage

PNs' generic communication skills, within the patient's stage of change

Multilevel analyses (model 1) revealed a significant association with one communication skill measured using the MAAS-global: 'summarizations' (Table 6.2). PNs summarize less during their conversations with patients who are in the action or maintenance stage than with patients in the other stages. Furthermore, trends appear for the items 'request for help', 'management' and 'empathy'. PNs tend to pay more attention to 'request for help' and 'management' with patients in the preparation stage than with patients in other stages ($P=0.07$ and $P=0.06$, respectively) and tend to show more empathy during the consultations with patient in the action or maintenance stage ($P=0.07$).

The regression coefficients range from -0.73 to 1.60. Hence, differences between the SOC are small. The intraclass correlation (ICC) on the generic communication skills range from >0.01 to 0.37 for model 1. After correcting for patient characteristics and lifestyle behaviour (model 2) the association between ‘summarizations’ and the action and maintenance stage was no longer significant. The coefficients hardly changed after this correction (results not shown).

The item ‘exploration’ correlates significantly, on a medium level, with ‘management’, ‘information giving’ and ‘structuring’ (all Pearson’s correlation of 0.41). Furthermore, the item ‘structuring’ also correlates significantly with ‘empathy’ (0.39). All other correlations are not significant or very small.

PNs’ clinical competence, within the patient’s stage of change

There were no items that showed significant different scores between the SOC with respect to the clinical competence of PNs (MAAS-global items 14-17) (Table 6.2). The intraclass correlation (ICC) on clinical competence range from 0.04 to 0.15 for model 1.

The clinical aspect ‘diagnosis’ correlates significantly with the clinical aspects ‘history taking’ (0.43) and ‘management’ (0.57).

Table 6.2 Regression coefficients of the Stages of Change on the MAAS-global items (Model 1)

	Stage of change: pre-&contemplation (regression coefficient, 95% CI)	Stage of change: preparation (regression coefficient, 95% CI)	Stage of change: action & maintenance (regression coefficient, 95% CI)
MAAS-global			
<i>Section 1: Communication skills for each separate phase</i>			
1. Introduction	0.84 (-0.20 – 1.88)	-0.61(-1.66 – 0.43)	-0.38 (-1.44 – 0.68)
2. Follow-up consultation	-0.32 (-0.79 – 0.16)	-0.03 (-0.64 – 0.58)	0.39 (-0.11 – 0.89)
3. Request for help	-0.43 (-1.23 – 0.38)	0.97 (-0.08 – 2.01)	-0.22 (-1.07 – 0.63)
4. Physical examination	0.06 (-0.39 – 0.51)	-0.02 (-0.60 – 0.56)	-0.05 (-0.54 – 0.43)
5. Diagnosis	0.03 (-0.39 – 0.45)	0.21 (-0.29 – 0.72)	-0.20 (-0.64 – 0.24)

Table 6.2 - To be continued -

	Stage of change: pre-&contemplation (regression coefficient, 95% CI)	Stage of change: preparation (regression coefficient, 95% CI)	Stage of change: action & maintenance (regression coefficient, 95% CI)
6. Management	0.22 (-0.14 – 0.58)	0.14 (-0.31 – 0.58)	-0.37 (-0.76 – 0.01)
7. Evaluation of consultation	0.17 (-0.76 – 1.11)	-0.42 (-1.56 – 0.72)	0.13 (-0.89 – 1.14)
<i>Section 2: General communication skills</i>			
8. Exploration	0.01 (-0.29 – 0.31)	0.32 (-0.04 – 0.68)	-0.27 (-0.59 – 0.04)
9. Emotions	-0.53 (-1.43 – 0.38)	-0.04 (-1.15 – 1.06)	0.70 (-0.33 – 1.74)
10. Information giving	0.12 (-0.18 – 0.42)	0.01 (-0.36 – 0.38)	-0.15 (-0.47 – 0.17)
11. Summarizations	0.32 (-0.31 – 0.95)	0.37 (-0.40 – 1.14)	-0.65 ^a (-1.32 – -0.01)
12. Structuring	-0.02 (-0.29 – 0.25)	0.29 (-0.04 – 0.62)	-0.20 (-0.50 – 0.09)
13. Empathy	-0.09 (-0.27 – 0.10)	-0.11 (-0.33 – 0.12)	0.18 (-0.02 – 0.37)
<i>Section 3: Medical aspects (comply with guidelines)</i>			
14. History taking	0.07 (-0.31 – 0.46)	0.07 (-0.40 – 0.55)	-0.15 (-0.57 – 0.27)
15. Physical examination	0.01 (-0.19 – 0.21)	0.04 (-0.21 – 0.30)	-0.04 (-0.25 – 0.17)
16. Diagnosis	0.07 (-0.15 – 0.30)	0.15 (-0.12 – 0.42)	-0.21 (-0.44 – 0.03)
17. Management	0.03 (-0.22 – 0.28)	0.07(-0.24 – 0.38)	-0.09 (-0.36 – 0.18)

^a Significant difference between this stage of change and the other stages of change on MAAS-global item (P<0.05)

Motivational Interview skills of PNs, within the patient's stage of change

The majority of the BECCI-domains and separate BECCI items did not differ significantly between the three SOC. There were three BECCI items (items 1, 4 and 8) that did show significant differences between patient's SOC. PNs encourage patients to talk about behaviour change (item 4) more in the precontemplation and in the contemplation stage, than in the preparation stage and in the action and maintenance stage, and also more in the

preparation stage than in the action and maintenance stage (see Table 6.3). This finding confirms our first hypothesis. PNs invite patients more often in the preparation stage to talk about behaviour change (item 1) than during the other stages. PNs 'acknowledge challenges about behaviour change that patients face' (item 8) less during the action and the maintenance stage than during the other SOC. These findings are fairly in line with hypotheses 2 and 4. The significant coefficients range from -0.43 to 0.59. This indicates that differences between the SOC are small. The intraclass correlation (ICC) on the four BECCI domains and BECCI mean sum score range from 0.02 to 0.10 for model 1. The ICC on the eleven BECCI items ranges from 0.02 to 0.25 for model 1.

The significant correlations between the four BECCI domains are between 0.38 and 0.5, indicating medium correlations. The significant correlations between the items of the BECCI were small to medium and ranged from 0.21 and 0.53. However, items six and seven of the BECCI show only significant (small) correlations with, respectively, item four and items four and five.

After correcting for patient characteristics and lifestyle behaviour most differences remain with the exception of 'PN acknowledges challenges about behaviour change that the patient faces' (item 8), which was only borderline significant. The (significant) coefficients hardly changed after this correction. However, these analyses reveal another positive significant association between the mean sum scores of the BECCI domains and the different SOC (results not shown). Apparently, PNs apply their MI skills on average more when patients are in the preparation stage than in the other SOC.

Table 6.3 Regression coefficients of the Stages of Change on the BECCI domains, the BECCI mean sum score and separate BECCI items (Model 1)

	Stage of change: pre-&contemplation (regression coefficient, 95% CI)	Stage of change: preparation (regression coefficient, 95% CI)	Stage of change: action & maintenance (regression coefficient, 95% CI)
Domain 1 Agenda setting and permission seeking	-0.02 (-0.21 – 0.17)	0.22 (-0.013 – 0.45)	-0.15 (-0.56 – 0.05)
Domain 2 The why and how of change in behaviour	0.08 (-0.45 – 0.30)	-0.00 (-0.27 – 0.27)	-0.09 (-0.33 – 0.14)
Domain 3 The whole consultation	0.00 (-0.25 – 0.26)	0.29 (-0.02 – 0.60)	-0.25 (-0.52 – 0.02)
Domain 4 Talk about targets	-0.14 (-0.47 – 0.19)	0.31 (-0.08 – 0.71)	-0.08 (-0.43 – 0.27)
BECCI mean sum score	-0.02 (-0.21 – 0.17)	0.21 (-0.02 – 0.44)	-0.15 (-0.35 – 0.06)
1. Practitioner invites the patient to talk about behaviour change	-0.12 (-0.41 – 0.16)	0.44 ^a (0.10 – 0.78)	-0.20 (-0.50 – 0.11)
2. Practitioner demonstrates sensitivity to talking about other issues	0.08 (-0.09 – 0.26)	-0.01 (-0.23 – 0.21)	-0.09 (-0.28 – 0.10)
3. Practitioner encourages the patient to talk about current behaviour or status quo	0.14 (-0.03 – 0.31)	-0.12 (-0.33 – 0.10)	-0.07 (-0.26 – 0.12)
4. Practitioner encourages the patient to talk about behaviour change	0.31 (-0.02 – 0.64)	0.08 (-0.33 – 0.49)	-0.43 ^a (-0.77 – -0.08)
5. Practitioner asks questions to elicit how the patient thinks and feels about the topic	-0.09 (-0.50 – 0.33)	0.06 (-0.45 – 0.57)	0.06 (-0.40 – 0.51)

Table 6.3 - To be continued -

	Stage of change: pre-&contemplation (regression coefficient, 95% CI)	Stage of change: preparation (regression coefficient, 95% CI)	Stage of change: action & maintenance (regression coefficient, 95% CI)
6. Practitioner uses empathic statements when the patient talks about the topic	0.16 (-0.65 – 0.97)	-0.22 (-1.22 – 0.77)	0.01 (-0.88 – 0.85)
7. Practitioner uses summaries to bring together what the patient says about the topic	0.58 (-0.36 – 1.51)	0.14 (-1.04 – 1.32)	-0.82 (-1.89 – 0.25)
8. Practitioner acknowledges challenges about behaviour change that the patient faces	-0.10 (-0.54 – 0.35)	0.59 ^a (0.06 – 1.12)	-0.35 (-0.83 – 0.12)
9. When practitioner provides information, it is sensitive to the patient concerns and understanding	0.16 (-0.10 – 0.41)	0.10 (-0.21 – 0.42)	-0.27 (-0.54 – 0.01)
10. Practitioner actively conveys respect for the patient choice about behaviour change	-0.02 (-0.30 – 0.26)	0.15 (-0.18 – 0.49)	-0.11 (-0.41 – 0.19)
11. Practitioner and the patient exchange ideas about how the patient could change current behaviour	See Domain 4	See Domain 4	See Domain 4

^a Significant difference between this stage of change and the other stages of change on BECCI item/domain (P<0.05)

Discussion

The present study provides a first foray into the application of PNs' generic communication skills, clinical competence and MI skills within the patient's SOC, during actual consultations between patients and PNs. Our results showed that PNs do adjust their MI skills to patients' SOC, but only to some extent. PNs tailored one generic communication skill ('summarizations') to

the patient's SOC, and trends did appear for the items 'request for help', 'management' and 'empathy'. Clinical competence, i.e. the application of evidence-based guidelines, were not adapted to patient's SOC.

Our findings did partly confirm our hypotheses. In particular - as expected - PNs do encourage patients to talk about behaviour change more in the precontemplation and contemplation stage than during the other stages, and also more during the preparation stage than during the action and maintenance stage. However, in contrast to what we expected, PNs invite the patient to talk about behaviour change in the preparation stage more than during the precontemplation and contemplation stage. Although PNs do invite the patient to talk about behaviour change more during the preparation stage than during the action and maintenance stage. The other hypotheses could not be confirmed, these being: that PNs are more likely 'to ask questions to elicit how the patient thinks and feels about behaviour change' during the precontemplation and contemplation stage than during the other stages; that PNs 'acknowledges challenges about behaviour change that the patient faces' less during the action and maintenance stage than during the other stages of change; that PNs and patients are more likely 'to exchange ideas about how the patient could change current behaviour' during the preparation stage than during the other SOC.

PNs therefore apply their MI skills on average more when patients are in the preparation stage than in the other SOC. This suggests that, to some extent, PNs intuitively assess the stage of patients' readiness to change and tailor their communication consequently. After all, PNs (and patients) were not aware of the focus of our observations (i.e. patient's SOC), and in the end differences between the stages were small. However, PNs were aware that their MI skills were being evaluated.

As expected, PNs' clinical competence did not vary by SOC group. This finding supports the validity of our analyses; we were able to find (small) skill differences by SOC group for some MI and generic communication skills, but not for all skills (i.e. clinical competence, among others). However, more research is needed to replicate these findings with larger groups of patients and in different settings.

Previous research suggests that interventions that are tailored to a person's SOC are better than generic approaches [22,38,39]. A recent study on preventing weight gain also concludes that the stage to which a person belongs does matter [40]. In contrast, Aveyard et al. [41] reported that their stage-matched self-help intervention was not more effective for smoking

cessation than their self-help control intervention. However, a commentary by Prochaska [42] revealed that the control intervention in the study by Aveyard et al. [41] was in fact also stage appropriate. Furthermore, earlier studies recommend using MI within the SOC Model, since it systematically guides patients towards motivation for change [8,43]. By teaching PNs to explicitly identify a patient's SOC they could enhance their adaptation of MI (and general communication) skills. This is especially pertinent since previous research [25] suggests that MI skills are difficult to apply in daily practice.

It would thus appear that PNs amount of SOC tailoring in real-life consultations is small and could benefit from brief, reliable and valid screening instruments. For this purpose, Prochaska and colleagues have produced several questionnaires (available on their website <http://www.uri.edu/research/cprc/measures.html>, accessed 18-01-2012) that can be used in daily practice to assess a patient's readiness of change.

Strengths and limitations

The present study provides an initial investigation into the daily application of PNs' MI and general communication skills to patients' SOC. Furthermore, we observed the BECCI independently of SOC (i.e. by using different observers) so that ratings of PNs' MI skills were not influenced by SOC scores. We also analysed the separate items of the BECCI instead of solely relying on the BECCI domain scores. Low Cronbachs alphascores for the BECCI domains justify this choice. In addition, SOC is a theoretical construct that can be easily and reliably used in daily practice because of its concreteness. By using SOC, healthcare providers can assess the level of a patient's involvement and readiness to change their behaviour, and evaluate the intervention, in contrast to other theories or models like the Health Belief Model and Social Cognitive theory [8]. Besides, MI and SOC are complementary clinical theoretical frameworks. Another strength of our study is the high average interrater agreement scores between observers and the use of validated clinical measures to assess PN's skills (i.e. BECCI and MAAS-global).

Some limitations should also be noted. Firstly, both observation protocols (the BECCI and the MAAS-global) focus on communication skills of healthcare providers and do not include patients' statements or the patient-provider interaction. Secondly, we used the MAAS-global for coding nurses' communication skills even though this instrument was originally developed

for physicians. Therefore, some aspects of the protocol seem less relevant for observing PNs' communication. Since most patients visit the PN every three months over a lengthy period of time, the PN is already familiar with the patient's reason to attend the consultation. In this context, the item 'introduction' on the MAAS-global seems less applicable. In addition, the assessment of patient's SOC was based on the conversation between the patient and PN. We did not ask the patients themselves about their current SOC. Although the independent coding of patient's SOC resulted in complete interrater agreement, future research should investigate the overlap between both methods.

We also grouped the stages of change together for analyses purposes, resulting in three combined stages instead of the five stages developed by Prochaska and DiClemente [19]. Although this could have affected our outcomes, our grouping was consistent with previous studies on SOC [44,45].

It was also not possible to observe all the elements of the Transtheoretical Model. Therefore we selected the elements of 'consciousness raising' and 'dramatic relief', which were approximately in accordance with our hypotheses. We acknowledge that the Transtheoretical model also proposes other processes of change that are relevant in patient-provider interactions [11,18,20]. Future research should aim to observe other theoretical constructs of the Transtheoretical Model as well.

In addition, when a patient presented multiple unhealthy behaviours during one consultation we selected one behaviour for which we defined the SOC; (1) the behaviour for which SOC was clearly manifested during the consultation, and if still multiple behaviours remained (2) the behaviour for which acting upon change was, at that moment, most profitable (e.g. the earliest SOC), as indicated during the consultation. We gave priority to the (pre)contemplation and preparation stages over action and maintenance stages. It might well be that for some patients actually more than one behaviour needed to be addressed. It remains an empirical question whether multiple unhealthy behaviours should be targeted simultaneously or subsequently after one behaviour has been changed successfully [46].

Finally, by selecting patients who smoked or did not adhere to the Dutch physical activity norm we could have underestimated the discussion of smoking and physical activity in other consultations between PNs and patients.

In conclusion, this is a first exploratory study examining how motivational interviewing (MI) is adapted to patients' stages of change (SOC). Further research is necessary to detect if similar results can be found among other populations, behaviours and countries. Future research could investigate if combining MI (and general communication skills) with SOC is the most (clinical) effective strategy for PNs, and other health care providers within primary care, in helping patients to change their lifestyle behaviour and also maintain healthy behaviour. This is even more important as a meta-analysis on MI by Miller's research group [47] suggests that standard MI only may not suffice in producing longer-lasting effects. This can be done by comparing counselling that combines MI and SOC with counselling that is only based on MI.

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7

Web-enabled video-feedback: a method to reflect on the communication skills of experienced physicians

Noordman J, Verhaak P, van Dulmen S. Web-enabled video-feedback: a method to reflect on the communication skills of experienced physicians. *Patient Education and Counseling* 2011;82:335-340.

Abstract

Objective

To describe our web-enabled video-feedback method designed to reflect on the communication skills of experienced physicians.

Methods

Participating physicians (n=28) received a 'personal web link' to two of their video-recorded consultations. After watching the consultations physicians received feedback by telephone or in a face-to-face meeting, structured around an individualized feedback report. This report contained scores on the communication behavior of the physician in comparison with colleagues and their own communication behavior observed in a previous study, as well as patients' opinions about their physician's communication behavior. The physicians were asked to reflect on their communication skills and to comment on the usefulness and efficiency of the feedback method.

Results

Almost all physicians were satisfied with the feedback method and in particular valued the web-enabled link to the video-recorded consultations and the structured written report. Feedback by telephone or face-to-face feedback was considered equally appropriate.

Conclusion

This web-enabled video-feedback method is a useful and structured design to reflect on the communication skills of physicians.

Practice implications

As part of continuing medical education, feedback on communication skills should become a recurrent activity for experienced physicians. This method can also be used to reflect on the communication skills of medical students.

Introduction

Continuing medical education (CME) is necessary to update and reflect on the knowledge and (communication) skills of experienced physicians in everyday practice [1-4]. CME can have various forms, such as didactic large-group presentations, workshops, small groups, individualized feedback, training sessions or integrating several approaches [2].

While communication skills training for medical students has become part of their education since the early nineties in Europe, USA and Australia [5-7], post-graduate education focuses mainly on biomedical and technical aspects of health care [5]. This means that most physicians receive no structural training or feedback on their communication skills after vocational training. Furthermore, previous research suggests that there is an inverse relationship between years in practice and certain aspects of the quality of such as adherence to standards of practice for diagnosis, screening, appropriate therapy and knowledge [8]. It is possible that over the years physician's communication with the patient also becomes a routine operation, leading to a decrease in patient-centered and empathic behavior and a more businesslike communication pattern [9,10].

Several studies found that medical education can result in an overall improvement of the communication skills of medical students and physicians, especially when the training includes a form of feedback on providers' actual performance [6,11]. Aspegren and colleagues [6] for instance described several studies where feedback resulted in receiving more information from the patient, better interpersonal skills and an ability to interview beyond traditional teaching (i.e. instruction, lecture, textbook). Successful feedback has been found to consist of well observed tasks and competencies, an expert observer and feedback provider, highly specific information, an explicit standard, personal observation, an explicit aim of performance improvement and a plan to re-observe [12]. In addition, the most effective feedback is feedback provided by a credible, authoritative source over a number of years [13].

Video-feedback seems an optimal method to reflect on and teach communication skills to physicians. Such feedback is based on reviews of recorded real-life physician-patient interactions. Video-feedback has been demonstrated to enhance physicians' reflection on their own communication skills and has a more long-term impact than traditional didactic methods

[7,14-16]. A more recently developed and time-efficient approach is the online demonstration of video-recorded communication skills [17].

Although Cegala and colleagues identify a general lack of information about which specific communication skills were taught to physicians in previous studies [18], there are studies that indicate which communication aspects are feasible for feedback. Common elements include: patient-centered behavior [7,11,19-22], shared decision making [11,22], summarizing [11,19,20,22], information giving [7,19,21], non-verbal behavior [19,22] and showing and responding to empathy/feelings [7,19-21,23]. Patients' opinions are also important for providing feedback: physicians are highly motivated to learn from the views of their patients [24] and sensitive to patient dissatisfaction [25].

In this context we designed a video-feedback method, including patients' evaluations, to reflect on the communication skills of experienced physicians. The aim of the present paper is to describe our partly web-enabled, video-feedback method which is structured around a written individualized report. We will (1) test the feasibility of our new feedback method and (2) explore opinions of experienced physicians regarding the feedback method.

In line with others our feedback involves 'collecting information on performance measures for individual physicians and then providing this information to the physicians with comparisons with colleagues and other standards' [12,26].

Methods

Population

Forty Dutch primary care physicians participated in a study on physician-patient communication in 2007-2008 [27]. These physicians agreed to have approximately twenty consecutive, everyday consultations videotaped. The recording with an unmanned camera took place on one or two random days. This resulted in a total of 808 video-recorded consultations (patient response 78%). The majority of these physicians (n=35) had their consultations also video-taped in a previous study in 2001 [28,29].

Physicians who participated in the study are all members of the Netherlands Information Network of General Practice (LINH). LINH is a representative network of currently 180 Dutch physicians and 340,000 patients, spread

throughout the Netherlands [30]. A convenience sample of 93 physicians was drawn from LINH, with priority for physicians that had participated in the 2001 study. Forty physicians agreed to participate in the feedback study (response 44%). These doctors are representative for Dutch physicians regarding sex and practice form (solo -, duo-, group practice or health centre).

The study was carried out according to Dutch privacy legislation. The privacy regulation was approved by the Dutch Data Protection Authority. Current practice in the Netherlands does not require ethical approval for this observatory study. However, ethical principles were adhered to in this study, and the anonymity of patients and physicians is guaranteed. All participating physicians and patients filled in an informed consent form before the recording of the consultation. Due to the position of the camera patients were only visible at the back of their head or not visible at all. Patients could withdraw their consent at any time; no one did.

Web-enabled video-feedback

Initially, 39 of the 40 physicians were interested in receiving feedback. Five of these only received feedback on medication adherence as part of a parallel project and were therefore not included in the present study. From the remaining 34 videotaped physicians, six physicians withdrew nonetheless from the feedback due to a previously unforeseen busy working period, which resulted in a total of 28 physicians who received web-enabled feedback.

Physicians who agreed to participate in the video-feedback received a secured 'personal web link' on which they could observe the two selected consultations. This enabled them to watch the consultations at their office desk or at home. To this purpose, physicians obtained an email with two personal web links; by clicking on the links they were able to watch two of their own video-recorded consultations. They could watch these consultations through a media player as many times as they liked for about two weeks and had the option to pause the videos. After watching the consultations eight of the physicians received feedback on their communication behavior by telephone for half an hour, the other 20 in a face-to-face one-hour meeting.

The feedback was structured around an individualized feedback report. This report contained items on the communication behavior of the physician in comparison with their colleagues and with their own communication

behavior in a previous study in 2001 [28,29]. The report contained also patient ratings about the communication of the physician. All topics in the feedback report were systematically discussed (Table 7.1). The feedback report consisted of 16 figures or tables with short explanations (see for illustration Figure 7.1). This meant that during physicians' feedback the following was discussed: the overall ratings of all the physicians, the mean ratings of the consultations of the particular physician (in the recent and previous study), and the two selected consultations of the physician.

At the start of the feedback session, physicians were asked to evaluate their communication behavior (in general and during the selected consultations in particular) (see Table 7.2). We did not give directions on the topics they should pay attention to when evaluating their own communication. Afterwards they were asked to comment on the usefulness and efficiency of the feedback method (Table 7.2). During the feedback session the physicians could react at any time to the results that were discussed. For the purpose of analysis, we audio-recorded physicians' reactions during the face-to-face meetings; during the telephone feedback their comments were not recorded but were written down instantly.

In the previous study, carried out in 2001 [28,29], physicians also received feedback based on video-recorded consultations. The aim of the previous feedback was also to reflect on the communication skills of experienced physicians. In contrast with the previous feedback, the recent feedback method enabled physicians to watch their consultations through a web-enabled link beforehand. Besides, the recent feedback was structured around a written report.

Nearly all physicians who participated in the recent feedback (n=20) had received feedback in the previous 2001 study; consequently they could reflect on and compare both feedback methods.

After the feedback the personal internet link to the consultations was removed. Physicians who participated in the feedback received CME points (for education purpose).

Table 7.1 Topics of the feedback report

1. Length of the consultations
2. Affective behavior of the physician (as part of RIAS [31]):
Non-verbal:
 - patient-directed gaze*Verbal:*
 - social conversation
 - shows approval
 - show agreement/ understanding
 - paraphrase/ check
 - empathy
 - concern or worry
 - reassures/ encourages
 - disapproval/ criticism
3. Instrumental behaviour of the physician (as part of RIAS [31]):
 - orientation/ instruction
 - bid for repetition
 - ask for understanding
 - ask for opinion
 - request for services
 - ask question (medical/therapeutic, psychosocial, social context, lifestyle)
 - give information (medical/therapeutic, psychosocial, social context, lifestyle)
 - give advice (medical/therapeutic, psychosocial, social context, lifestyle)
4. Patient-centeredness
5. Discussing lifestyle behaviour of the patient (about smoking, alcohol, diet and exercise)
6. Discussing patients rights (in view of the Dutch Medical Treatment Act)
7. Computer use of the physician during consultations
8. Patients' ratings (preferences, experience and decision making)
9. Other noteworthy communication aspects of the physician

Table 7.2 Questions asked to physicians before and after the feedback

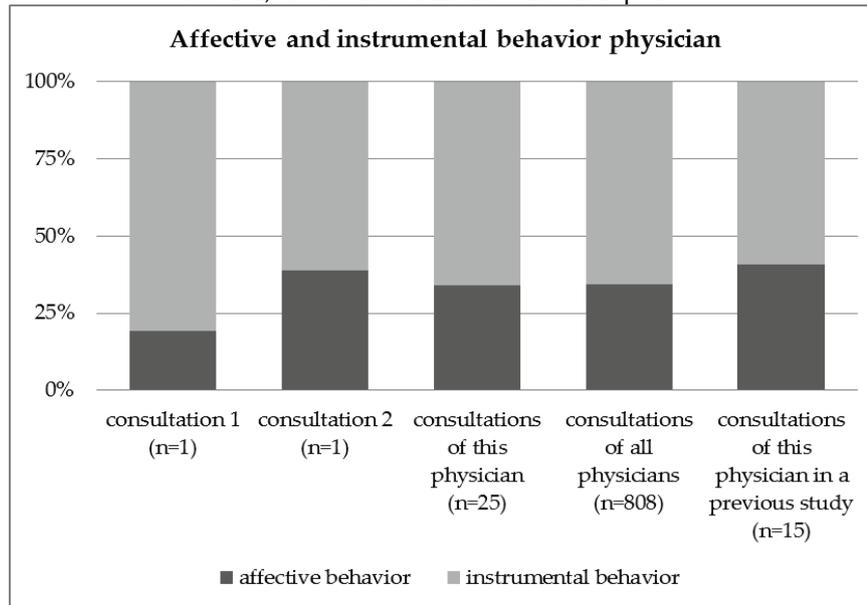
Questions before the feedback:

1. What is your opinion about your communication with the patient during the two selected consultations? Please point out positive and improvement points for the two consultations.
2. What do you find difficult about communicating with a patient in general?

After the feedback:

3. What is your opinion on the feedback you received? Do you miss something?
4. What is your opinion about the method of feedback you received? (by telephone or face-to-face, written report and able to watch your consultations through a web-enabled link)
5. You also received face-to-face feedback during a previous study in 2001. Can you compare the method of feedback from 2001 with the one you just received? Which one do you prefer and why?

Figure 7.1 Illustration of physician's affective and instrumental behavior, as described in the written report



The physician in this example showed on average more instrumental than affective behavior. During consultation 1 of this physician the percentage affective behavior was low, but during consultation 2 it was higher. In a previous study this physician showed slightly more affective behavior than during the current study.

Observations

The consultations were coded by six observers, using an observation list. Observers in 2008 and 2001 were trained by the same trainer.

Observers rated the amount of instrumental and affective behavior and the amount of patient-directed gaze measured using the Roter Interaction Analysis System (RIAS) [31]. Each utterance (word or sentence) by the physician and patient was coded using a list of 40 behavioral codes. Instrumental communication behavior refers to question-asking, exchanging information and advice and affective behavior includes reassurance and showing empathy [31]. Patient-directed gaze, i.e. the time that the physician looked into the patient's face, was measured as a percentage of the time that the physician was in sight.

Besides, the visit length (in minutes) was registered as well as the level of patient-centeredness. Patient-centeredness was measured with three, five-point likert scaled items, looking at the extent to which the physician (1)

gives space to the patient and encourages him/her to disclose concerns, (2) finds mutual agreement (for instance, on a treatment plan) and (3) takes patient's perspective into account.

We also observed whether or not life style behaviors (smoking, alcohol, diet and physical activity) were discussed with the patient [32, 33] and if and what kind of computer use physicians showed during consultations [27]. In addition, we observed if physicians discussed topics relevant in view of the Dutch Medical Treatment Act [28]; i.e. (1) informing the patient about medical research and treatment, (2) discussing treatment options and mention alternatives, (3) mention possible side-effects and risks, (4) making a decision in concordance with the patient and (5) asking permission for research and treatment.

Besides, we mentioned ad hoc other noteworthy positive and negative communication aspects for each physician. For example, one physician summarized his consultations always at the end, another physician had a waiting attitude in many cases. Other noteworthy communication aspects were: exploring clearly, structuring the consultation (logical sequence of phases i.e. history taking, physical examination, advice about treatment), and informing the patient using printed materials or leaflets. All these assessments and comparisons, next to patients' ratings (see 2.4), were recorded in the written personalized feedback report.

We compared the mean scores of a physician with those of his or her 39 colleagues and with his or her own mean scores observed in a previous study in 2001.

Lastly, we selected two consultations per physician: one in which they showed a good communication style and one consultation in which there was room for improvement. We selected the two consultations based on the mean scores of the communication style of the physician (about e.g. patient centeredness, decision making, affective and instrumental behavior) relative to their own communication in the other recorded consultation and in relation with the other 39 participating physicians. Our aim was not to provide physicians with the extensive list of above mentioned topics as skills to discuss in every consultation, but to make them aware of their communication style and show them how to use the communication topics in an appropriate way in a particular consultation.

To compute interrater reliability, 70 of the same consultations were rated by four observers. Because the interrater reliability for the RIAS categories [31] was already calculated with Pearson's R [34] in 2001 we decided to calculate

the same categories also with Pearson's R for 2008. The interrater reliability for the other observed topics (between two observers) in 2008 were calculated with Cohen's kappa [35]. When an utterance was coded less than 5% we did not calculate the interrater reliability.

Patients' ratings

Patients filled in a questionnaire immediately before and after the recording of the consultation. They indicated their preferences and experiences regarding decision making about a possible treatment before and after the consultations, on a 5-point scale (1=the physician has to take/took all the decisions, 2= the physician has to take/took the decision, but in concordance with the patient, 3= the physician and patient have to take/took a decision together, 4= the patient has to take/took the decision, but in concordance with the physician, 5=the patient has to take/took all the decisions).

Furthermore, patients completed the QUOTE (Quality of Care through the Patients' Eyes) communication questionnaire [28,29], before and after the recorded consultation. Using this QUOTE-com, patients described their pre-visit preferences and post-visit experiences regarding communication aspects of the physician, on a 4-point scale. For example, before the consultation they indicated their level of importance on 'it is important that the doctor listened to me well' and after the consultation 'the doctor listened to me well' (1= not, 2= not really, 3= yes, 4=yes definitely). In line with a previous study, we assigned these aspects to affect-oriented communication or instrumental-oriented communication [28].

Affect-oriented communication consists for example of attentive and empathic behavior by the physician - listening and showing interest in the patient. Instrumental behavior includes exchanging information and advice, diagnosing and problem solving.

Results

Interrater reliability

The interrater reliability is high for almost all observed RIAS behavior, but moderate for the empathy physicians showed towards the patient and structuring of the consultation.

For all the other observed categories Kappa is sufficiently high (Table 7.3).

Table 7.3 reliability, Pearson's correlation & Cohen's Kappa

	Pearson's correlation ¹	
	2001	2008
<i>RIAS coding:</i>		
Patient-directed gaze	-	0.80
Questions asked by physicians	0.90	0.80
Information given by physicians	0.90	0.79
Physicians' empathy	-	0.51
Paraphrase/ check	0.85	0.77
Structuring	0.87	0.58
Show approval	0.95	0.93
<i>Other observed topics:</i>	Cohen's Kappa²	
Patient-centeredness	-	0.79
Discussing smoking behavior	-	0.79
Discussing alcohol use	-	0.66
Discussing nutrition	-	0.73
Discussing physical activity	-	0.74
Discussing patient rights (in view of the Dutch Medical Treatment Act)	-	0.80
No computer use	-	1.00
Computer use: to search for or read something	-	0.80

Table 7.3 - To be continued -

<i>Other observed topics:</i>	Cohen's Kappa²	
Computer use: to prescribe or refer a patient	-	0.95
Computer use: while the patient is changing clothes (for physical examination)	-	0.93
Computer use: when the physician is talking	-	0.61
Computer use: when the patient is talking	-	0.75
Computer use: while the patient waits silently	-	0.93

¹ Pearson's correlation interpretation: below 0.30=poor, 0.31-0.50=slight/fair, 0.51-0.80=moderate/substantial, 0.81-1.00=almost perfect. When utterances were coded less than 5% we did not calculate the interrater reliability.

² Cohen's Kappa interpretation: below 0.00=poor, 0.00-0.21=slight, 0.21-0.40=fair, 0.41-0.60=moderate, 0.61-0.80=substantial, 0.81-1.00=almost perfect. In 2001 the interrater reliability was not calculated for other topics than part of the RIAS coding.

Communication assessment

Physicians commented on their own communication behavior. The following examples illustrate how physicians evaluated their communication with the patient. One physician noticed that: *'I had a better posture than during my vocational training, but I use the computer quite a lot'*. Another physician mentioned that: *'I could not quite figure out the treatment demand of the patient and I did not mention alternative treatment options'*. He also pointed out that: *'I should think more transcend and from the point of view of the patient and should figure out what the patient wants'*. Another physician stated that he has sometimes problems with consultations becoming a routine procedure and that he also should explore the problem from the point of view of the patient more. Furthermore, several physicians mentioned that time pressure resulted in less patient-centered behavior.

Overall, physicians recognized their own behavior and physicians' self reported outcomes were in agreement with observed outcomes.

Technological aspects of feedback

All the physicians were able to watch their consultations through the web-enabled link, only two physicians mentioned a problem with the volume of their videos but this was immediately fixed (the volume button was switched off). Physicians used the web-enabled link on computers with Microsoft Windows as operating system.

Physicians' experiences with feedback

Almost all physicians (n=27) were positive about the feedback method. They valued the fact that they could watch the video-recorded consultations online in their own time and that the feedback was structured around a written report.

One physician mentioned that he liked in particular the structured written report and patients' opinions about his communication. Another physician was very pleased with the feedback: *'That I could watch my consultations online is fantastic! I think that every physician should do this, preferably every year. I also think that the feedback was nicely structured.'* One of his colleagues also liked to see her video-recorded consultations and referred to it as a sort of benchmark for communication. Two more physicians indicated that the written report was very nice and one of them mentioned that he received a lot more information about his communication than expected. An other physician was also content with the feedback method, but preferred guidance in what communication aspects he should pay attention to before he was asked to evaluate his consultations.

Furthermore, half of the physicians who received feedback by telephone (n=4) referred to the method as time saving. Besides, physicians who received feedback by telephone and physicians who received face-to-face feedback evaluated the feedback as equally satisfactory. Although, one physician who received telephone feedback preferred face-to-face feedback. He suggested using a video-conference method or webcam instead.

We also asked whether physicians preferred this feedback method or the feedback they received in the previous study in 2001. Five physicians who participated in the previous study did not remember the specifics of the feedback they received in 2001 and could not compare the feedback methods. The other physicians (n=15) found the present feedback method more efficient, time saving and more complete than the previous one. As stated before, they particularly liked the web-enabled link to the video-recorded consultations and the written report. One physician mentioned that *'this form of feedback is a better way to reflect on communication'*. Another stated that this feedback method was more useful because: *'I could always look back into the written report and remember where to pay attention to'*.

Lastly, comments from physicians show that the two selected consultations were well chosen. Physicians recognized themselves and mentioned that the two consultations were opposites; indicating that one showed more positive and the other more negative elements of their communication.

Discussion and conclusion

Discussion

This article described the feasibility and evaluation of a distinct video-feedback method designed to reflect on the communication skills of experienced physicians.

The initial reactions from physicians suggest that our method is feasible and appreciated and that the format was appropriate. Physicians liked in particular the web-enabled link to the video-recorded consultations and the structured written report. Comments about the content of our feedback consisted of one physician who mentioned that he received more information about his communication than expected and several physicians who stated that they in particular liked patients' opinions about their communication.

Physicians also indicated that the method was time saving, because they could watch the consultations online in their own time. Besides, feedback by telephone was considered time efficient. Especially, when one has to travel a long distance feedback by telephone would be an appropriate option. On the other hand video- recording, observing all consultations and writing a personal report is time consuming for the researchers. A possible solution is to observe fewer consultations than recorded and ask physicians directly after recording which consultation(s) they report as 'good' or 'need improvement' regarding their communication with the patient. In practice, physicians themselves can also record their consultations, point out two consultations and allow researchers or even colleagues or patients to review their consultations, as currently is being done in vocational training for physicians.

Whether feedback by telephone or face-to-face feedback is more useful in reflecting on the communication skills of physicians is not clear; both methods resulted in satisfactory evaluations from physicians. This suggests that especially the video-recorded consultations and the structured written report are the most valued characteristics of the feedback method. Several previous studies underline that feedback based on video-recorded consultations is an optimal method to reflect on and teach communication skills to physicians [7,14,15]. Also, the online availability of the video-recorded consultations was valued positively. A previous study, focusing on pediatric visits that included a mental health concern, also found that the

online demonstration of video-recorded communication skills is desirable [17].

Former studies have recommended regular feedback or training for practicing physicians [1-4]. As part of this continuing medical education, feedback on communication skills should also become a recurrent activity for experienced physicians. Continuing medical education should ideally include an experiential method, as for example our web-based video-feedback method, instead of formal didactic methods. Experiential methods have shown more effect on physicians' performance than traditional continuing medical education [1,2,6,19].

Relevance and application of the video-feedback method in Health Communication Research

A major strength of our feedback method is that physicians received feedback on different levels: (1) behavioral observations of physician-patient interaction and (2) patient-ratings of physician's communication skills. Besides, physicians evaluated their own communication skills. This is more or less in accordance with a recommendation from previous research [5], where the authors stated that measurements on communication skills should be performed on different levels, including the knowledge and attitude of physicians, their actual performance in daily practice and patient outcomes. Furthermore, Holm [4] suggests that continuing medical education must be based on both self assessment of physicians and peer review.

In concordance with the definition of 'strong feedback' of Van de Ridder and colleagues [12] our video-feedback method consists of well observable tasks and competencies, highly specific information, explicit standards, personal observation and is coded by expert observers and feedback providers. In contrast with their definition of strong feedback our method had not an explicit aim of performance improvement and we had no plan to re-observe. In addition, we did not provide feedback over a number of years as suggested by Veloski et al [13], but only once in 2001 and once in 2008.

The written individualized feedback report was seen as very useful by the physicians. Physicians could keep the report which enables them to look back at their performances and especially their improvements at any time. This feedback method can also be used to reflect on communication skills of medical students or other health care professionals. In addition, the video-

recordings could be used to reflect on physicians' behaviour with respect to medical content for example medical decisions on diagnoses.

We do not know whether our feedback method has a positive effect on physicians' performance, since we did not aim to measure the effects of our feedback sessions on physicians' actual communication skills. Future research could also examine if physicians improved their actual communication skills after the feedback, and possible differences between feedback by telephone compared to face-to-face feedback. Furthermore, further research could compare outcomes on physicians' communication between 2008 and 2001.

Besides, due to methodological limitations it was difficult to differentiate between the reactions of physicians on the feedback as a whole or to a specific detail of the feedback like the web-enabled link to the video-recorded consultation. More research with this feedback method is needed to estimate the impact of for example the web-enabled link or the written report.

In addition, we did not take context factors into account, like time pressure, previous and future contacts between physician and patient and goals and targets of both patient and physician [36]. These factors could have influenced the communication behavior of the physician, both positively and negatively.

Lastly, by using a secured web-link to the video-recorded consultations which was removed after the feedback session, we were able to take the privacy of the patient and physician into account.

Conclusion

This web-enabled video-feedback method is a feasible and appreciated tool to reflect on the communication skills of physicians. Physicians were especially satisfied with the web link to their recorded consultations and the structured written feedback report.

Practice implications

Continuing medical education requires a useful and structured method. This web-enabled video-feedback method is a valuable tool to provide feedback or training in communication skills to experienced physicians. It is based on both observations and patients' opinions about physicians' communication. Furthermore, our method consists of well observable tasks and competencies, highly specific information, explicit standards, personal

observation and is coded by expert observers and feedback providers. This method could also be useful for medical students and other health care professionals.

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8

Effects of video-feedback on the communication, clinical competence and motivational interviewing skills of practice nurses: a pre-test post-test control group study

Noordman J, van der Weijden T, van Dulmen S. Effects of video-feedback on the communication, clinical competence and motivational interviewing skills of practice nurses: a pre-test post-test control group study.
Under review.

Abstract

Background

Continuing medical education may be necessary to refresh and reflect on the communication and motivational interviewing skills of experienced primary care practice nurses. In this context, a video-feedback method was designed to improve the communication skills of practice nurses.

Objectives

To examine the effects of individual video-feedback on the generic communication skills, clinical competence (i.e. adherence to practice guidelines) and motivational interviewing skills of experienced practice nurses working in primary care.

Design

Pre-test/post-test control group design.

Setting

Eight primary care practices in the Netherlands. Data were collected between June 2010 and June 2011.

Participants 17 practice nurses and 325 patients.

Methods

325 practice nurse-patient consultations were videotaped at two moments (T0 and T1), with 3 to 6 months in between. The videotaped consultations were rated using two protocols. The MAAS-global was used to assess nurses' generic communication and clinical competence and the Behaviour Change Counselling Index to assess nurses' motivational interviewing skills. Before recording the consultations, nurses were allocated to a control or a video-feedback group. Nurses allocated to the video-feedback group received video-feedback between T0 and T1. Nurses in the control group received video-feedback after the study. Video-feedback consisted of watching two video-recorded consultations, a face-to-face one-hour feedback session and a written report. Data were analyzed using multilevel regression analysis.

Results

Practice nurses who received video-feedback appeared to pay significantly more attention to patients' request for help and their physical examination.

Furthermore, they gave significantly more understandable information ($P=0.02$). In addition, a trend appeared for 'exploration' ($P=0.07$). With respect to motivational interviewing, nurses who received video-feedback appeared to pay more attention to 'agenda setting and permission seeking' during their consultations ($P=0.01$).

Conclusions

This study suggests that video-feedback is a potentially effective method to improve practice nurses' generic communication skills. Furthermore, nurses evaluated the video-feedback (method) as useful. Although a single video-feedback session does not seem sufficient to increase all motivational interviewing skills, we did find significant improvement in some specific skills. Nurses' clinical competence, i.e. following medical guidelines, were not altered after feedback due to already high standards (ceiling effect).

What is already known about the topic?

- In the Netherlands, motivational interviewing is part of practice nurses' core curriculum
- Generally, implementing motivational interviewing in daily practice has been found to be difficult

What this paper adds?

- Video-feedback is an effective tool to improve practice nurses' generic communication skills
- Practice nurses' motivational interviewing skills already improve to some extent after a single session of video-feedback
- Due to a ceiling effect, video-feedback does not alter practice nurses' clinical competence

Introduction

In supporting patients to improve their lifestyle behavior, nurses' communication techniques can be crucial, since communication is nurses' primary tool during consultations [1,2]. A promising communication strategy in this respect is motivational interviewing. Recent studies indicate that motivational interviewing is effective in several domains of behavior change [3,4]. Motivational interviewing is a patient-centered approach which focuses on increasing intrinsic motivation to behavior change by helping patients explore and resolve ambivalence between desired behavior and actual behavior [3,5]. Motivational interviewing skills are supposed to be embedded in an interaction built on more generic communication skills (e.g. providing information, exploring wishes or expectations) and clinical competence (i.e. following medical guidelines) [6].

In The Netherlands, UK and beyond, primary care practice nurses monitor chronically ill and patients at risk for chronic illnesses (e.g. obese patients, who are at risk for developing Diabetes type 2 or heart and vascular disease) and provide them with education and support for behavior change [7,8], under supervision of general practitioners. Monitoring and supporting these patients require practice nurses to follow clinical guidelines (e.g. Dutch College of General Practitioners standards on Diabetes type 2, asthma/COPD, heart and vascular disease, quit smoking) [9].

Nowadays, practice nurses in The Netherlands are taught generic communication skills (e.g. exploring, providing information and advice) as well as motivational interviewing or 'behavior change counseling' skills as part of their standard education [9]. However, recent (international) studies among nurses in diabetes management and public health indicate that implementing motivational interviewing in daily care is not so easy [10-13]. Previous studies suggest that time pressure and the dominance of biomedical aspects during consultations are barriers for implementing motivational interviewing [8,10].

Continuing medical education may be necessary to refresh and reflect on the communication and motivational interviewing skills of experienced practice nurses in routine practice. Video-feedback, based on video-recorded real-life patient encounters, seems a promising method for continuing medical education [14]. A recent meta-analysis shows that video-feedback has a significant effect on the key communication skills of several different professionals (e.g. physicians, nurses) [15]. Video-feedback has enhanced

physicians' reflection of their own communication and has a more long-term impact than traditional didactic methods [16-18]. A more time-efficient method is the online demonstration of video-recorded communication skills [19]. In this context we designed a video-feedback method, which was found to be acceptable and useful for general practitioners [20]. It is, however, unknown to what extent this method affects the communication skills of practice nurses. Therefore, the following research question was addressed: What are the effects of individual video-feedback on the generic communication skills, clinical competence (i.e. adherence to guidelines) and motivational interviewing skills of experienced practice nurses working in primary care?

We hypothesize that video-feedback improves practice nurses' generic communication skills and motivational interviewing skills. Possibly, nurses' clinical competence (adherence to clinical guidelines) will not improve much, because of nurses' accountability (to general practitioners and as stipulated in the contract with the insurer) towards the compliance with guidelines [9] and therefore, expected high standards at baseline.

Methods

Participants and procedure

Practice nurses from seven practices were approached by contacting their general practitioners, who participated (except for one practice) in an earlier study performed by the Netherlands Institute for Health Services Research (NIVEL) [21] (47% of the general practitioners responded; six practices did not employ a practice nurse). Additionally, general practitioners from one other practice (health care center) contacted us for participation of all of their practice nurses. The study took place between June 2010 and June 2011. Our aim was to include twenty practice nurses. Altogether, twenty practice nurses from eight practices in the Netherlands agreed to have series of consecutive consultations videotaped at two moments (T0 and T1), with three to six months in between the recording moments. Approximately ten consultations per nurse were recorded on video at T0 and ten consultations per nurse at T1. Patients were approached by a researcher in the waiting room and signed a written informed consent form. Adult patients scheduled for an appointment with the practice nurse were eligible for inclusion (90% agreed to participate, no dropout). Nurses also signed an informed consent

form before the recording of the consultations. See Figure 8.1 for a flowchart of the inclusion procedure.

All nurses were trained in motivational interviewing (or behavior change counseling) as part of their education, of which thirteen nurses had had more elaborate post-education training in motivational interviewing [11] prior to our study.

The study was carried out according to Dutch privacy legislation. The privacy regulations were approved by the Dutch Data Protection Authority. According to Dutch legislation, approval by a medical ethics committee was not required for this observational study.

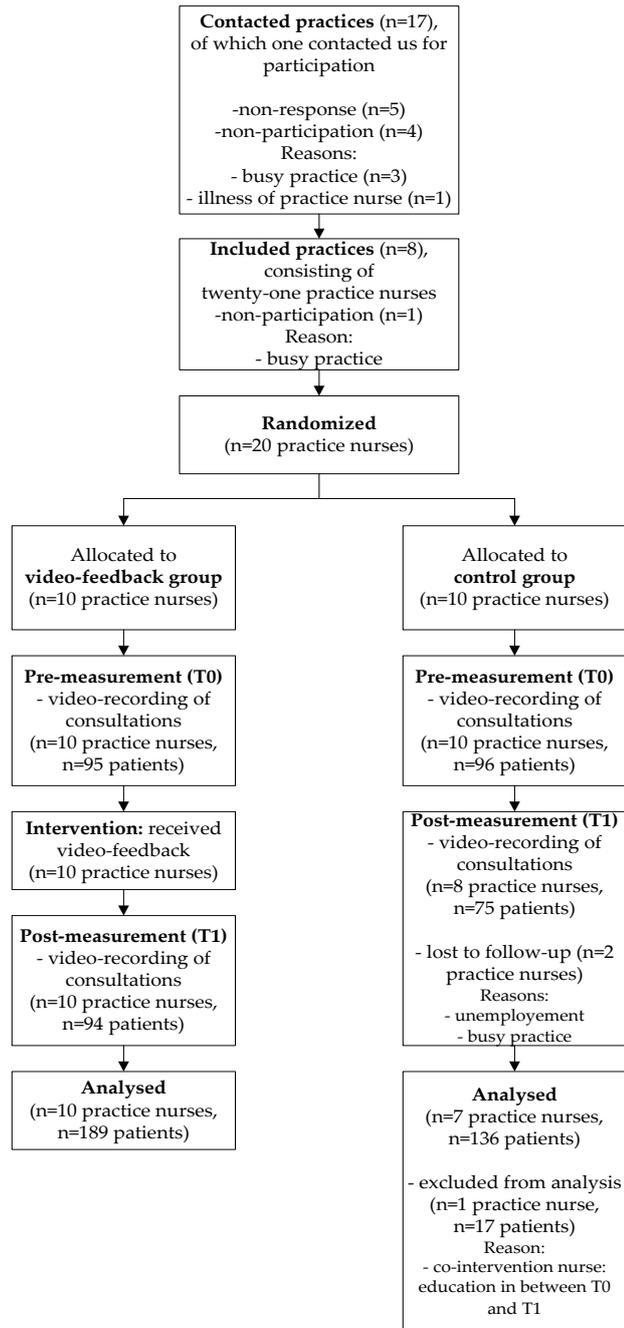
Allocation to control or video-feedback group

A pre-test/post-test control group design was used, in which all practice nurses were offered feedback (during or after the study), see section 'Web-enabled video-feedback'. Before the recording of the consultations, nurses were allocated to a control or video-feedback group. Nurses allocated to the video-feedback group received video-feedback between T0 (pre-measurement; first video-recording moment) and T1 (post-measurement, second recording moment), T1 taking place between one to two months after the video-feedback. Nurses in the control group received video-feedback after the study. To prevent contamination (i.e. cross-over of information between conditions), participants in the video-feedback group were explicitly asked not to discuss the feedback until all consultations of the control group participants were recorded.

Of the nine nurses from one healthcare center five nurses were allocated to the video-feedback group and four to the control group. The other eleven nurses from seven practices were consecutively allocated to the video-feedback group or control group per practice.

In the end, ten practice nurses were part of the video-feedback group and seven were part of the control group. Two nurses, assigned to the control group, only participated at T0 (because of having become unemployed or being too busy at T1) and were left out of the analysis. Also, one other nurse (assigned to the control group) was in the middle of her education between T0 and T1 and was left out of the analysis, because the education in between could influence our outcomes (i.e. to avoid co-interventions).

Figure 8.1 Flowchart of the inclusion procedure



Observations and analyses

The videotaped consultations were rated by two observers independently, using two validated protocols: (1) the MAAS-global [22] and (2) the Behaviour Change Counselling Index [23,24]. Observer software [25] was used to code the video-recorded consultations; items of the observation protocols were programmed in Observer.

The MAAS-global was used to rate nurses' generic communication and clinical competence. This protocol is divided into three sections (Appendix 6); communication skills for each separate consultation phase (from introduction until evaluation of consultation), general communication skills (e.g. exploration, information giving) and clinical aspects (adherence to guidelines), each item is to be rated on a scale ranging from 0 'not present' to 6 'excellent'. Some items (e.g. follow-up consultation in case of a first encounter) could be scored as 'not applicable' (see Appendix 6) and were left out of the analyses.

The Behaviour Change Counselling Index was used to assess nurses' application of motivational interviewing skills for every consultation. This protocol contains eleven, five-point Likert-scaled items related to the practitioners' behavior and motivational interviewing techniques, ranging from 'not at all' to 'a great extent'. These items are subdivided into four domains: agenda setting and permission seeking (two items, Cronbach's $\alpha=0.49$); the why and how of change in behavior (five items, $\alpha=0.71$); the whole consultation (three items, $\alpha=0.76$); and talk about targets (one item). As recommended by the author of this protocol [23,24], not applicable items were replaced by mean substitution (see Appendix 4).

To establish interrater reliability, ten percent of the 325 consultations were coded by both observers. Interrater agreement between observers was sufficiently high, with average Kappa scores [26] of 0.85 (range 0.72 -1.00) for the MAAS-global and 0.85 (range 0.77 -0.95) for the Behaviour Change Counselling Index.

Web-enabled video-feedback

All practice nurses received individual 'web-enabled video-feedback', during (video-feedback group) or after (control group) the study. Previously, this method was used to reflect on the communication skills of experienced physicians [20]. For the present purpose, two consultations were selected for each nurse: one in which they showed a good communication style and one consultation in which there was room for

improvement. We selected the two consultations based on the mean scores of the communication style of the nurse (i.e. scores on the MAAS-global and Behaviour Change Counselling Index) relative to their own communication in the other recorded consultations and in relation with corresponding scores of the other participating nurses. Our aim was not to provide nurses with an extensive list of topics (i.e. items from the MAAS-global and Behaviour Change Counselling Index) as skills to discuss in every consultation, but to make them aware of the strengths and weaknesses in their communication style and show them how to use the communication topics in an appropriate way in a particular consultation.

Nurses received a secured individual web link on which they could observe the two selected consultations. They obtained an email with two personal web links; by clicking on the links they were able to watch the two video-recorded consultations selected for them. This enabled them to watch the consultations at their office desk or at home, during one to two weeks. After watching the consultations nurses received feedback, by one of two researchers, on their generic communication skills, clinical competence (i.e. adherence to guidelines) and motivational interviewing skills, during an individual face-to-face one-hour meeting with a researcher. The feedback was structured around an individual feedback report. This report contained items on the communication behavior of the nurses in comparison with their colleagues and concluded with a 'take-home message'; in which the good elements and improvement points of their communication skills were summarized. Before providing feedback, the two researchers discussed their findings and method of delivery with each other.

At the start of the feedback session, nurses were asked to reflect upon their own communication behavior (in general and during the selected consultations in particular). We did not give directions on the topics they should pay attention to when evaluating their own communication. Afterwards they were asked to comment on the usefulness and efficiency of the feedback (method) [20].

Statistical analyses

First, characteristics of the practice nurses and patients in the control and video-feedback group were described. Differences between the groups were tested using an independent t-test for continuous variables and chi-square test for dichotomous and categorical variables. Second, the average scores

for the BECCI-domains and items of the MAAS-global were described for the control and video-feedback group on T0 (pre-measurement).

Third, multilevel linear and logistic regression analyses were performed. Three levels were used; patients (level 1), time of measurement (level 2) and practice nurses (level 3). 'Time of measurement' was used as level 2 because of different patients at T0 and T1, respectively. First, a null model for every dependent variable (e.g. BECCI domain or MAAS-global item) was created, thereby correcting for patient's social demographic characteristics – age, gender and ethnicity (model 0). We created these separate models for every dependent variable to avoid multiple testing. Next, we added time of measurement (T0 versus T1), research group (control versus video-feedback group) and the interaction term between time of measurement and research group to the model (model 1). Multilevel linear regression was used to determine the association between the four domain scores of the BECCI, BECCI total score, the BECCI items, (almost all) MAAS-global items (dependent variables) with the interaction term between time of measurement and research group (e.g. the effect of video-feedback) (model 1). The MAAS-global items 'Introduction', 'Request for help', 'Evaluation of consultation' and 'Emotions' were coded as dichotomous variables and analyzed with multilevel logistic regression, using the second order MQL method.

The descriptive analyses were performed in Stata 11 (2009) and the multilevel analyses in MLwiN 2.25 [26].

Results

Sample

At pre-measurement (T0), 163 consultations between 17 practice nurses and 163 patients were analyzed. At post-measurement (T1), 162 consultations between 17 practice nurses and 162 patients were analyzed (see Figure 8.1).

Characteristics and communication skills of practice nurses and characteristics of patients

In Table 8.1 the characteristics of practice nurses, patients and nurses' generic communication, clinical competence and motivational interviewing skills in the video-feedback and control group at pre-measurement (T0) are presented.

Nurses in the video-feedback group did not differ significantly with respect to gender, working experience and age from nurses in the control group, at pre-measurement. However, the groups differed in whether they had received post-educational training in motivational interviewing ($P<0.01$). All nurses ($n=10$) in the video-feedback group and three nurses in the control group received post-educational motivational interviewing training prior to T0, i.e. prior to our study. This motivational interviewing training varied between 1/2 day to six half days [11].

At pre-measurement (T0), nurses in the video-feedback group did not differ from nurses in the control group with respect to their generic communication, clinical competence and motivational interviewing skills. Except for one generic communication skill: nurses in the control group 'structured' their consultations significantly more compared to nurses in the video-feedback group ($P=0.04$).

Patients in the video-feedback group differed from patients in the control group with respect to age and ethnicity ($P<0.01$), at pre-measurement. Therefore, further analyses controlled for patients' characteristics.

No significant differences were found between the mean consultation duration (in minutes) and the type of consultation (i.e. first consultation or follow-up consultation) of the video-feedback and control group at pre-measurement.

Table 8.1 Characteristics of practice nurses (n=17), patients (n=163) and nurses' generic communication, clinical competence and motivational interviewing skills at pre-measurement (T0), in control and video-feedback group

Characteristics	Video-feedback group	Control group	P-value
<i>Practice nurses (n)</i>	10	7	-
Female (%)	100	100	-
Age in years (Mean, SD)	40 (5.9)	46 (5.3)	0.06
Experience in years (Mean, SD)	4.2 (2.4)	5.6 (3.3)	0.34
Prior post-educational training in Motivational interviewing (%)	100	43	<0.01*
<i>Patients (n)</i>	95	68	-
Female (%)	52	49	0.70
Age in years (Mean, SD)	65 (11.6)	59 (14.1)	<0.01*
Ethnicity** (%)			<0.01*
- Autochthons	87	69	
- Western-immigrants	8	7	
- Non-Western immigrants	4	21	
- 'Missing'	1	3	
<i>Consultation duration (minutes)</i>	20.59	23.42	0.06
<i>Type of consultation (% first consultations)</i>	10%	16%	0.18
Practice nurses' generic communication skills (MAAS-global) (Mean scores, SD)			
Introduction	1.4 (1.11)	1.6 (1.25)	0.31
Follow-up consultation	3.6 (1.21)	4.0 (1.38)	0.13
Request for help	0.7 (1.20)	1.0 (1.35)	0.41
Physical examination	3.9 (1.29)	4.1 (1.58)	0.13
Diagnosis	3.1 (1.25)	3.5 (1.06)	0.46
Management	3.7 (1.11)	3.6 (1.01)	0.16

Table 8.1 - To be continued -

Practice nurses' generic communication skills (MAAS-global) (Mean scores, SD)	Video-feedback group	Control group	P-value
Evaluation of consultation	1.3 (1.45)	1.1 (1.26)	0.58
Exploration	4.3 (0.91)	4.7 (0.70)	0.13
Emotions	1.6 (1.60)	1.5 (1.61)	0.55
Information giving	3.7 (0.90)	4.0 (0.74)	0.17
Summarizations	2.4 (1.65)	2.0 (1.69)	0.20
Structuring	4.2 (0.85)	4.4 (0.96)	0.04*
Empathy	5.1 (0.41)	5.2 (0.52)	0.22
Practice nurses' clinical competence (MAAS-global) (Mean scores, SD)			
History taking	4.1 (1.26)	4.3 (1.14)	0.45
Physical examination	4.7 (0.62)	4.7 (0.59)	0.92
Diagnosis	4.8 (0.65)	4.7 (0.58)	0.34
Management	4.7 (0.72)	4.7 (0.60)	0.13
Practice nurses' motivational interviewing skills (Behaviour Change Counselling Index) (Mean scores, SD)			
<i>Domain:</i>			
1. Agenda setting and permission seeking	2.1 (0.63)	2.3 (0.55)	0.35
2. The why and how of change in behavior	1.6 (0.64)	1.6 (0.73)	0.32
3. The whole consultation	2.1 (0.74)	2.1 (0.80)	0.70
4. Talk about targets	1.8 (0.83)	2.0 (0.80)	0.51
Mean sum score	1.8 (0.60)	1.9 (0.61)	0.83

* Significant difference between video-feedback group and control group (P<0.05)

** 'Ethnicity' according to CBS definition (www.cbs.nl)

Notes: 1 to 20 cases of the MAAS-global were excluded due to missing data (i.e. not applicable items of the MAAS-global were coded as missing). Scale of the MAAS-global: 0= not present, 1= poor, 2= unsatisfactory, 3= doubtful, 4= satisfactory, 5= good, 6= excellent. Scale of the Behaviour Change Counselling Index: 0= not at all, 1= minimally, 2= to some extent, 3= a good deal, 4= a great extent.

Effect of video-feedback on practice nurses' generic communication skills

In Table 8.2 the regression coefficients of practice nurses' generic communication skills (according to the MAAS-global) at pre- and post-measurement are depicted.

Comparisons were made between the scores of the video-feedback group and the control group, at post measurement and at pre-measurement. Three significant differences emerged. At post measurement, nurses in the video-feedback group appeared to pay more attention to patients' request for help ($P<0.01$) and to the physical examination (for example measuring blood pressure) ($P<0.01$). Furthermore, they gave more understandable information ($P=0.02$) during their consultations. In addition, a trend appeared for the item 'exploration' ($P=0.07$). Nurses in the video-feedback group tend to pay more attention to exploring patients' wishes, expectations and responses, at post measurement. The significant regression coefficients range from 0.61 to 1.66. Hence, differences are small. Intra Class correlations (ICCs) ranged from 0.00 for 'request for help' (no difference between nurses) to 0.28 for 'physical examination' (quite large difference between nurses' application of the skill), pointing to the need to use multilevel analyses.

Table 8.2 Regression coefficients (model 1) of practice nurses' generic communication skills (according to the MAAS-global) at pre- (T0) and post- measurement (T1), corrected for patient characteristics

Generic communication skills (MAAS-global)	Regression coefficient (95% CI) Pre- (T0) versus post-measurement (T1)	Regression coefficient (95% CI) Control versus video-feedback group	Regression coefficient (95% CI) Interaction term between measurement and group	P-value	ICC
Introduction (n=312)	0.20 (-0.82 – 1.01)	0.02 (-1.02 – 1.04)	-0.05 (-1.23 – 1.17)	0.93	0.06
Follow-up consultation (n=270)	-0.24 (-0.54 – 0.42)	-0.23 (-0.76 – 0.60)	0.39 (-0.50 – 0.75)	0.22	0.18
Request for help (n=307)	0.05 (-0.69 – 0.73)	-0.33 (-0.79 – 0.56)	1.66 (-0.15 – 1.77)	<0.01*	0.00
Physical examination (n=290)	-0.57 (-0.53 – 0.29)	-0.14 (-0.85 – 0.73)	0.86 (-0.30 – 0.77)	<0.01*	0.28

Table 8.2 - To be continued -

Generic communication skills (MAAS-global)	Regression coefficient (95% CI) Pre- (T0) versus post-measurement (T1)	Regression coefficient (95% CI) Control versus video-feedback group	Regression coefficient (95% CI) Interaction term between measurement and group	P-value	ICC
Diagnosis (n=311)	-0.62 (-0.50 – 0.26)	-0.31 (-0.58 – 0.42)	0.39 (-0.40 – 0.60)	0.13	0.10
Management (n=312)	-0.44 (-0.44 – 0.28)	0.04 (-0.48 – 0.49)	0.04 (-0.46 – 0.48)	0.88	0.14
Evaluation of consultation (n=311)	-0.73 (-1.09 – 0.50)	0.16 (-0.89 – 1.04)	0.84 (-0.59 – 1.48)	0.16	0.09
Exploration (n=314)	-0.66 (-0.52 – 0.26)	-0.29 (-0.55 – 0.41)	0.48 (-0.39 – 0.64)	0.07	0.12
Emotions (n=313)	-0.13 (-0.78 – 0.68)	0.15 (-0.96 – 1.12)	-0.15 (-1.04 – 0.89)	0.78	0.16
Information giving (n=314)	-0.52 (-0.48 – 0.28)	-0.26 (-0.42 – 0.32)	0.61 (-0.34 – 0.64)	0.02*	0.02
Summarizations (n=314)	0.24 (-0.78 – 1.10)	0.33 (-0.50 – 0.64)	0.02 (-0.74 – 0.76)	0.96	0.23
Structuring (n=312)	-0.11 (-0.37 – 0.33)	-0.17 (-0.51 – 0.43)	0.35 (-0.38 – 0.54)	0.14	0.18
Empathy (n=312)	-0.35 (-0.22 – 0.15)	-0.03 (-0.21 – 0.21)	0.15 (-0.22 – 0.26)	0.22	0.08

* Significant difference between video-feedback and control group, at post measurement (T1) compared to pre- measurement (T0) (P<0.05). Notes: ICC= Intra Class Correlation on practice nurse level; CI= Confidence Interval. 11 to 55 cases were excluded due to missing data (i.e. not applicable items were code as missing)

Effect of video-feedback on practice nurses' clinical competence

In Table 8.3 the regression coefficients of nurses' clinical competence (according to the MAAS-global) at pre- and post-measurement are presented. No differences were found between the scores of the control and video-feedback group at pre- and post-measurement. ICCs ranged from 0.04

(for the competence 'management') to 0.18 (for the competence 'physical examination').

Table 8.3 Regression coefficients (model 1) of practice nurses' clinical competence (according to the MAAS-global) at pre- (T0) and post- measurement (T1), corrected for patient characteristics

Clinical competence (MAAS-global)	Regression coefficient (95% CI) Pre- (T0) versus post-measurement (T1)	Regression coefficient (95% CI) Control versus video-feedback group	Regression coefficient (95% CI) Interaction term between measurement and group	P-value	ICC
History taking (n=313)	-0.16 (-0.40 – 0.34)	-0.13 (-0.53 – 0.46)	0.29 (-0.42 – 0.56)	0.25	0.10
Physical examination (n=291)	0.02 (-0.23 – 0.24)	0.03 (-0.31 – 0.32)	0.13 (-0.28 – 0.32)	0.40	0.18
Diagnosis (n=313)	0.11 (-0.18 – 0.20)	0.05 (-0.20 – 0.21)	-0.01 (-0.25 – 0.24)	0.93	0.05
Management (n=312)	0.01 (-0.25 – 0.26)	-0.06 (-0.27 – 0.25)	0.10 (-0.32 – 0.35)	0.54	0.04

Notes: ICC= Intra Class Correlation on practice nurse level; CI= Confidence Interval. 12 to 34 cases were excluded due to missing data (i.e. not applicable items were code as missing)

Effect of video-feedback on practice nurses' motivational interviewing skills

Multilevel analyses showed one significant difference on nurses' motivational interviewing skills, measured with the Behaviour Change Counselling Index (Table 8.4). At post-measurement, nurses in the video-feedback group appear to pay more attention to 'agenda setting and permission seeking' (domain 1) (P=0.01). Analysis of the underlying items of domain one (1. 'nurse invites the patient to talk about behavior change' and 2. 'nurse demonstrates sensitivity to talking about other issues') revealed that both items showed a significant effect in favor of the video-feedback group at post-measurement, with P-values of 0.04 and 0.02, respectively (results not shown in Table 8.4). No other significant differences were found between the scores of the control and the video-feedback group at pre- and post-measurement. The regression coefficients range from 0.01 to 0.39,

indicating small differences. ICCs ranged from 0.00 (for domain 3 and 4) to 0.16 (for domain 2).

Table 8.4 Regression coefficients (model 1) of practice nurses' motivational interviewing skills (according to the Behaviour Change Counselling Index) at pre- (T0) and post- measurement (T1), corrected for patient characteristics

Motivational Interviewing skills (Behaviour Change Counselling Index)	Regression coefficient (95% CI) Pre- (T0) versus post-measurement (T1)	Regression coefficient (95% CI) Control versus video-feedback group	Regression coefficient (95% CI) Interaction term between measurement and group	P-value	ICC
<i>Domains:</i>					
1. Agenda setting and permission seeking	-0.32 (-0.26 – 0.19)	-0.22 (-0.27 – 0.21)	0.39 (-0.24 – 0.35)	0.01*	0.04
2. The why and how of change in behavior	-0.25 (-0.28 – 0.22)	0.04 (-0.35 – 0.37)	0.17 (-0.30 – 0.35)	0.32	0.16
3. The whole consultation	-0.49 (-0.43 – 0.26)	0.04 (-0.32 – 0.33)	0.01 (-0.45 – 0.45)	0.96	0.00
4. Talk about targets	-0.42 (-0.27 – 0.27)	-0.08 (-0.33 – 0.31)	0.13 (-0.41 – 0.47)	0.57	0.00
<i>Mean sum score</i>	-0.37 (-0.33 – 0.23)	-0.06 (-0.29 – 0.27)	0.18 (-0.33 – 0.40)	0.34	0.03

* Significant difference between video-feedback and control group, at post measurement (T1) compared to pre- measurement (T0) (P<0.05). Note: ICC= Intra Class Correlation on practice nurse level; CI= Confidence Interval. 11 cases were excluded due to missing data on patient characteristics (n=314 for all domains)

Practice nurses' evaluation of the video-feedback

All practice nurses were satisfied with the feedback they received. Also, the method of feedback was acknowledged as beneficial. Nurses were particularly satisfied with the option to watch their video-recorded consultations (using the web-link) and the structured feedback report. The face-to-face one-hour session in which feedback was provided was also

appreciated to a great extent. Nurses valued the extensiveness of the feedback and measurements used. Furthermore, nurses stated that they recognized themselves in the provided feedback and expected that they were able to 'put the feedback into practice'. However, there were also some less positive comments about the (method of) feedback. Some nurses had to watch their recorded consultations at home, because they were not able to watch these at work (due to security/network restrictions of the practice). Furthermore, one nurse (from the control group) did not want to watch her recorded consultations, because she thought it would be too confronting. Still, she did receive the face-to-face feedback and written report. In total, fifteen of the seventeen nurses had watched their consultations before the face-to-face feedback session as intended. In addition, after the feedback session one nurse suggested to provide feedback in future on two, quite similar consultations instead of the ones we selected. In contrast, her colleague recommended using two different consultations in the future, because she found the two we selected too similar. Finally, one nurse mentioned that the time between the first recording of the consultations (pre-measurement) and the feedback was too lengthy (i.e. 2.5 months). Nevertheless, seeing the video-recorded consultations did prompt her memory.

Discussion

The overall aim of our research was to evaluate the effects of individual video-feedback on the generic communication skills, clinical competence (i.e. adherence to guidelines) and motivational interviewing skills of experienced practice nurses working in primary care.

Providing individual video-feedback to experienced practice nurses resulted in improvement of some of their generic communication skills (i.e. request for help, physical examination and information giving) and motivational interviewing skills (i.e. agenda setting and permission seeking). Additionally, all nurses evaluated the video-feedback (method) as useful. In accordance with our previous feedback study [20], nurses were particularly satisfied with the option to watch their video-recorded consultations (using the web-link) and with the structured feedback report.

No effect of the video-feedback was found on nurses' clinical competence, possibly due to already high clinical standards (ceiling effect) at pre-measurement.

Nurses adhered to clinical guidelines to a great extent. Previous research suggests that adhering to the biomedical aspects of guidelines can conflict with a patient-centered approach as motivational interviewing [8,10,28]. More specifically, it is possible that adhering to quality indicators based on clinical guidelines during consultations is an impediment to the use of motivational interviewing. Such quality indicators may be part of financial incentive and reimbursement systems and therefore demand practice nurses to meet certain task requirements, but nurses also need to take the patients' motivation into account as part of motivational interviewing. Further research should examine if these seemingly conflicting tasks can become intertwined or if combining these tasks in an appropriate way is too much to ask for.

Furthermore, a single session video-feedback may not be sufficient to improve nurses' motivational interviewing skills to a great extent. Still, we did find some significant improvement in nurses' motivational interviewing skills after only one feedback session. This is remarkable, since nurses who were more extensively trained in motivational interviewing (prior to our study) did not differ from nurses who were not trained in motivational interviewing, at pre-measurement in our study. However, it is possible that a basic amount of motivational interviewing knowledge is needed to increase the effect of individual feedback. So far, it is unknown how much and which training is actually needed for motivational interviewing [29].

Video-feedback did positively affect a couple of nurses' generic communication skills, and, to a lesser extent, also nurses' exploring skills. Especially 'exploring' is known to be a difficult skill to apply [30], for which any improvement is welcome.

Future studies are necessary to examine the long-term effects of video-feedback on nurses' communication skills and how much feedback or training is needed to improve the implementation of motivational interviewing in daily practice. Previous research among physicians suggest that the most effective feedback is systematic feedback (i.e. according to a predefined protocol) provided over a number of years [31], since many practitioners tend to return to old counseling habits after a few months [32]. In this respect it is important to make sure that the training is correctly implemented in daily practice (to safeguard the 'transfer' from knowledge to

practice) and to examine what hinders this process, by means of video-observation research [33].

In addition, it is also important to investigate the role of patients in facilitating or hindering nurses' application of motivational interviewing. It is possible that motivational interviewing is not suitable for all patients and that some patients even show resistance to motivational interviewing.

Strengths and limitations

This is the first study, to our knowledge, that aims to improve the communication and motivational interviewing skills of experienced practice nurses by using video-feedback.

A strength of our study is that it is based on the (quantitative) assessment of real-life consultations instead of relying on more subjective methods as for example questionnaires. Besides, practice nurses evaluated their own communication and the video-feedback (method).

There are also some limitations. Due to pragmatic reasons (i.e. taken into account their possibilities for recording days in relation to their part-time job as well as consecutively allocated at time of application), stratified allocation, and blinding of practice nurses was not possible. Besides, observers were not entirely blinded to the intervention. This could have influenced our outcomes.

Furthermore, the number of practice nurses (n=17) was too small to allow for correction of nurses' characteristics in the multilevel analyses (i.e. prior post-educational motivational interviewing training and amount of 'structuring' differed between video-feedback group and control group at pre-measurement). However, we did control for patient characteristics. In addition, the second order MQL method was used for multilevel logistic regression, since first and second order PQL could not be performed due to too many values of zero (for example, 'introduction' was not present many times and scored as zero). MQL could underestimate the random parameters (variance) compared to PQL.

Another limitation was the low Cronbach's alpha score on BECCI domain one (two items, $\alpha=0.49$). Nevertheless, analysis of the underlying two items of domain one revealed the same significant association(s). Furthermore, the video-feedback resulted in a short-time improvement of some of nurses' generic communication skills and motivational interviewing skills. Long-

term effects have yet to be investigated, including a larger number of practice nurses.

Conclusion

This study suggests that video-feedback, including a face-to-face session and written report, is a potentially effective method to improve practice nurses' generic communication skills. In addition, practice nurses evaluated the video-feedback (method) as useful. Although, one-time video-feedback may not be sufficient to increase motivational interviewing skills. Still, we did find some significant improvement in nurses' motivational interviewing skills after only one feedback session. Nurses' clinical competence, i.e. their adherence to guidelines, was not altered after the feedback, possibly due to already high standards (i.e. ceiling effect).

Future research is necessary to investigate how much training is required for motivational interviewing and which method(s) are most useful. Furthermore, the long-term effects of video-feedback should be examined.

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Summary and discussion

In this chapter the results of our studies are summarised and discussed in view of earlier findings, theory and research methodology. The chapter will conclude with implications for clinical practice and research.

Summary

Aim

The aim of the present thesis was to examine GPs' and PNs' performance of lifestyle counselling during routine primary care consultation, targeting patients' behavioural change in smoking, alcohol use, physical activity and dietary habits. The following research questions were answered and the main results are subsequently summarized:

Part I (literature study):

1a. What is known in the literature about effective face-to-face communication-related behaviour change techniques (BCTs) used in interventions in patients' lifestyle behaviour, i.e. smoking, alcohol, nutrition, weight and physical activity?

1b. What is known in the literature about which primary care provider, GP or nurse, is more effective in using face-to-face communication-related BCTs?

Part II (observational studies):

2. How do GPs and PNs perform lifestyle counselling and apply motivational interviewing in routine primary care consultations?

Part III (feedback studies):

3a. Is video-feedback a feasible and acceptable method to reflect on communication skills according to GPs?

3b. What is the effect of video-feedback on the communication skills, clinical competence and motivational interviewing skills of PNs?

Main findings

Part I: Effective face-to-face communication-related behaviour change techniques

In the first part of this thesis, **Chapter 2**, the literature is systematically reviewed on the relative effectiveness of face-to-face communication-related behaviour change techniques (BCTs) used in interventions in patients' lifestyle behaviour. Furthermore, this chapter also describes which primary care provider (GP or nurse) was more effective in using face-to-face

communication-related BCTs, according to the literature. In total 50 studies were included and assessed on their methodological quality. Twenty-six studies reported significantly favourable health outcomes following communication-related BCTs and provided enough evidence according to a 'best evidence synthesis'.

The results indicated that behavioural counselling, motivational interviewing, education and advice all seem to be potentially effective communication-related BCTs. However, it was not possible to unravel the underlying working mechanisms of the BCTs that might be crucial to the effective outcomes. Furthermore, these BCTs were also found in less successful studies because of differences in, for example, design of the study or patient population, and to some extent quality of the studies.

Finally, existing literature showed that one primary care profession (GP) is not better equipped than the other (nurse), apparently, to provide face-to-face communication-related BCTs.

Part II: Observational studies in primary care; the professionals' role

The second part of this thesis focuses on cross-sectional observational studies. Chapter three to six described GPs' and PNs' application of communication skills and motivational interviewing skills in lifestyle counselling during routine consultations.

Chapter 3 explores whether or not healthy and unhealthy lifestyle choices of patients are currently being discussed more often in primary care consultations than in former decades. Therefore, observations of routine GP-patient consultations from 1975 until 2008 were used. Furthermore, GPs' approach to lifestyle behaviour was analysed as a population, high risk or symptom approach. The 'population approach' refers to discussing lifestyle behaviour with all patients, the 'high risk approach' refers to discussing lifestyle behaviour with patients with (a risk of) a chronic disease, and the 'symptom approach' refers to discussing lifestyle behaviour when relevant to the patient's presented symptom, without the patient being at high risk or having a chronic disease (e.g. asking about smoking habits when the patient is coughing). Besides, it was examined whether the discussion of lifestyle behaviour was related to characteristics of the patients, such as gender, age and educational background.

Results showed that the discussion of smoking behaviour and physical activity has increased somewhat over time. A change in discussion of

nutrition (diet) and alcohol was not significant. Still lifestyle behaviour was discussed in only a minority of the consultations. Overall, alcohol use was the least discussed and physical activity the most discussed during GPs' consultations.

This study also indicated that GPs mainly discussed patients' lifestyle when it is relevant to the patient's complaint (i.e. symptom approach) and do not discuss lifestyle behaviour as a routine procedure (i.e. do not include it in primary prevention). Finally, we found that lifestyle behaviour is more often discussed with older, male patients (except for nutrition), but no differences were found in frequencies between patients from different educational backgrounds (except for physical activity, which was discussed more often with patients with a college or university degree).

Chapter 4 explores the way in which GPs (n=39) and PNs (n=19) performed lifestyle counselling, in terms of providing information and advice about lifestyle and applying motivational interviewing. Therefore, 124 and 141 consultations were selected, respectively, that included any discussion about the patient's lifestyle. The provided information and advice was divided into tailored or generic, i.e. more or less patient-centred, respectively.

This study demonstrated that both GPs and PNs somehow performed lifestyle counselling according to generally accepted criteria. Information about lifestyle was mainly given in generic terms by GPs and PNs. Overall, few patients were given advice about their lifestyle behaviour. When PNs did provide lifestyle advice, they did this most often in a tailored way. GPs delivered both generic and tailored advice. Advice about smoking behaviour was most often tailored to the patient. Furthermore, GPs hardly ever applied MI in their consultations about patient's lifestyle behaviour. PNs trained in MI, did apply this technique, but only to some extent.

Chapter 5 shows that experienced PNs (n=13), who had extra post-educational training in MI prior to our study, had difficulty applying MI during everyday consultations (n=117). PNs applied MI to some extent, with substantial variation between the separate MI items. Furthermore, we found no difference in PNs' application of MI skills concerning primary or secondary prevention consultations. A possible explanation for the lack of differences between the two types of prevention consultations may be the gain to help patients in primary prevention by preventing complications,

equals the necessity to help the disease from aggravating in secondary prevention.

Chapter 6 analyses PNs' (n=19) application of MI skills, generic communication skills and clinical competence within patients' Stages of Change (SOC) - (pre)contemplation, preparation, or, action and maintenance - during everyday consultations (n=103).

This study revealed that PNs adapt their MI skills to a patient's SOC to some extent. It was found that on average PNs apply MI skills more to patients in the preparation stage than in the other stages of change (pre-contemplation, contemplation, action and maintenance). PNs adjusted three MI skills and one generic communication skill to patients' SOC. This explorative study suggests that, at least to some extent, PNs intuitively assess the stage of patients' readiness to change and tailor their communication accordingly. However, differences between the stages were small.

Part III: Effects of video-feedback on professionals' communication & motivational interviewing skills

The third part of this thesis comprised of our feedback studies.

Chapter 7 describes the video-feedback method, developed to reflect on the communication skills of experienced GPs. First, GPs (n=28) received a personal, secured web-link to two of their video-recorded consultations. Second, after having watched their consultations, GPs received feedback by telephone or in a face-to-face one-hour session, structured around a written individual feedback report. The report contained scores on the communication behaviour of the GP in comparison with colleagues and their own communication behaviour observed in a previous study, as well as patients' opinions about their GP's communication behaviour. The GPs were asked to reflect on their communication skills and to comment on the usefulness and efficiency of the feedback method. In the end, almost all GPs were satisfied with the feedback method and in particular valued the web-enabled link to the video-recorded consultations and the structured written report. Feedback by telephone or face-to-face feedback was considered equally appropriate.

Chapter 8 examines the effects of individual video-feedback, comparable to that described in Chapter 7, on the generic communication skills, clinical competence (i.e. adherence to clinical guidelines) and MI skills of

experienced PNs (n=17), in a pre-test/post-test control group design. First, 325 PN-patient consultations were videotaped at two moments (T0 and T1), with 3 to 6 months in between. Second, these consultations were rated using two validated observation protocols and analysed with multilevel regression analysis. Before recording the consultations, PNs were allocated to a control or an experimental group. PNs allocated to the experimental group received video-feedback between T0 and T1. PNs in the control group received video-feedback after the study.

This study showed that video-feedback is a potentially effective method to improve PNs' generic communication skills. PNs who received video-feedback appeared to pay significantly more attention to patients' request for help and their physical examination (e.g. explaining the blood pressure control). Furthermore, they gave significantly more understandable information. In addition, a trend appeared for more 'exploration'. Besides, PNs evaluated the video-feedback (method) as useful.

Although a single video-feedback session seemed not sufficient to increase all MI skills, significant improvement in some specific MI skills was found. PNs who received video-feedback paid more attention to 'agenda setting and permission seeking' during their consultations. Finally, this study found that PNs' clinical competence, i.e. adhering to guidelines, did not change after feedback due to already high standards prior to the feedback (ceiling effect).

Methodological reflections

Compared to other studies into lifestyle counselling in primary care, this study has several overall assets. To start with, a sample of routine primary care consultations of GPs and PNs was included, without concentrating on specific patient populations. As such, our results do represent the actual daily situation in general practice. Furthermore, GPs, PNs and patients were not aware of the fact that our observations focussed on communication about lifestyle behaviour. However, PNs were aware that their MI skills were assessed.

As mentioned before, this study comprised of real-life video-recorded GP-patient and PN-patient consultations. Prior studies [1,2] have relied on professionals' and patients' self-reported evaluations of lifestyle communication in consultations, which often does not result in reliable

results about the actual communication. Lastly, a novel feature of our study was the use of web-enabled video-feedback, which seemed to be a feasible and acceptable method according to GPs and PNs, and resulted in improvement of some generic communication skills and more specific MI skills in the PNs under study.

The methodological strengths and weaknesses of different parts of the studies in this thesis, i.e. the sample, design, instruments and outcome measures, will be discussed more specifically below.

Samples under study

All patients who were scheduled for an appointment with the GP or PN on the random days of the video-recordings were invited to participate by a researcher in the waiting room. The response rate for patients who participated in the GP and the PN study was 77.6% and 90%, respectively. This is high in comparison with other studies using video-recordings of consultations [3]. Non-responders most often mentioned the private character of their conversation or the questionnaire(s) as reasons for non-participation. In the GP-patient study, non-responders were somewhat older and more often of female gender [4]. Non-responding patients in the PN-study did not differ from responders regarding gender. We could not compare the age of the non-responding patients in the PN study with the age of the participants in this study, because only few non-responders provided their age. Response rates of participating GPs (44%) and PNs (47%) indicate sufficient interest to participate, although not (yet) all professionals seem to be open to this kind of research or seemed too busy at the time of the study.

Furthermore, GPs in our study (n=40) represent the Dutch GPs regarding gender and practice form (single, duo, group practice or healthcare centre), but were on average 4 years older than the average Dutch GP. It was not possible to determine whether or not the sample of PNs (n=20) was representative for the Dutch population of PNs, since numbers of PNs working in the Netherlands are incomplete. Additionally, the samples of the GP-patient (n=808) and PN-patient (n=350) consultations were relatively small. Also, GPs and PNs represent different patient samples; PNs receive (or create) a patient population with mostly chronically ill patients or patients at risk for chronic illness who potentially benefit from lifestyle interventions, whereas lifestyle counselling is only a part of GPs' workload.

Furthermore, the studies took place in different time-periods. The GP-patient consultations were video-recorded in 2007-2008 and the PN-patient consultations in 2010-2011. This could have influenced our outcomes. However, to our best knowledge, no policy changes with respect to discussing a patient's lifestyle behaviour were implemented between 2007 and 2011. Although, recently there is more attention for using MI in primary care consultations of GPs [5] and the development and implementation of the 'Beweegkuur' (a multidisciplinary lifestyle intervention for people with (risk at) diabetes type 2) took place between 2007 and 2012 [6]. Finally, all PNs were trained in MI and 13 of the 20 PNs received extra post-education training in MI prior to our study, while all but one GP were untrained in MI. Therefore, the results on MI skills of PNs and GPs are not comparable and should be interpreted with this information in mind.

Study design

This thesis is based on three designs; a systematic literature study (Part I), cross-sectional observational studies (Part II) and a pre-test/post-test controlled intervention study (Part III; Chapter 8). Most studies reported in this thesis (Part II: Chapter 3-6) used a cross-sectional design. A disadvantage of this design is the inability to attribute cause and effect. Furthermore, one consultation per patient was included. So, it is possible that patient's lifestyle behaviour is already discussed in a previous consultation or the GP or PN planned to discuss it in a future consultation.

In the third part of this thesis (Chapter 8) a pre-test/post-test controlled intervention study was used. PNs' performed skills in the experimental group differed marginally from those of PNs in the control group at baseline, i.e. in whether or not they had received prior post-educational MI training and how structured their consultations were. We could however not control for this difference because of the small number of PNs. Furthermore, due to pragmatic reasons, randomization, stratified allocation, and blinding of PNs were not possible. Besides, observers were not entirely blind to the intervention, because they also performed data acquisition and provided video-feedback to some extent.

The patient-professional encounters reported in this thesis involved different GPs and PNs. It may be argued that consultations with the same professional (GP or PN) are more similar than those with different professionals (i.e. patients nesting within professionals) [7]. Therefore, if the

data allowed us to, we controlled for clustering of patients within PNs or GPs in the analysis using multilevel regression analysis [7].

Observational instruments

In this thesis GP-patient and PN-patient encounters were videotaped and communication was coded with two psychometrically sound instruments; (1) the Behaviour Change Counselling Index (BECCI) for rating professionals' MI skills [8,9], and (2) the MAAS-global for coding professionals' generic communication skills and their clinical competence [10]. In previous research, the BECCI has demonstrated acceptable levels of reliability, validity and sensitivity to detect change [9,11,12]. The MAAS-global, also validated, is widely used to assess the communication skills of Dutch primary care professionals [10,13,14]. Additionally, the average interrater agreement between observers was sufficiently high for both the BECCI and the MAAS-global.

However, a disadvantage of both the BECCI and MAAS-global is that they focus on the communication behaviour of the professional, thereby neglecting the utterances of patients and the interaction (sequences) between patient and professional. Furthermore, we used the MAAS-global for coding PNs' communication skills even though this instrument was originally developed for GPs. Some aspects of the protocol may be less relevant for observing PNs' communication. For example, since most patients visit the PN every three months over a lengthy period of time, the PN is (most of the time) already familiar with the patient's reason to attend the consultation. In this context, the item 'introduction' on the MAAS-global seems less applicable. Besides, a recent study suggests that the MAAS-global does not account for certain context variables that influence the communication between professional and patient, such as familiarity with the patient or the experience of the health care provider [15].

The BECCI is developed for brief consultations in healthcare settings [9] and selects crucial elements of MI. It can be used by both researchers and trainers. However, there are other observational instruments to assess (all) MI skills of professionals; the Motivational Interviewing Skills Code (MISC) [16] and the Motivational Interviewing Treatment Integrity Code (MITI) [17]. The MISC [16] does incorporate scores on patient as well as practitioner behaviours, which may be useful in examining patient outcomes. However, the MISC takes extensive time to execute (i.e. several passes per consultation) and is less appropriate for brief consultations into behaviour

change like PN consultations. The MITI [17] also focusses on the communication behaviour of the professional, but uses very global measures and is still in development. Therefore, the BECCI seemed to be the most suitable instrument for this thesis.

Finally, we coded GPs' and PNs' communication about patient's lifestyle behaviour with a self-developed lifestyle counselling protocol in Chapter 4. This protocol has not been validated or used before, but demonstrated high interrater agreement between observers. In addition, the assessment of patient's stage of change (SOC) was based on the conversation between the patient and PN. We did not question the patients themselves about their perception of their current SOC. Although the independent coding of patient's SOC resulted in complete interrater agreement, future research should investigate the overlap between both methods.

Video-feedback tool

To improve the communication skills, clinical competence and MI skills of PNs we used the method of video-feedback. The video-feedback included a web-enabled link to two video-recorded consultations, a face-to-face one-hour session and a written feedback report. This combination of intervention components of video-feedback resulted in small but significant effects on several generic communication skills and, to a smaller extent, on MI skills of PNs. However, we were unable to draw conclusions about the effects of either of the components of the video-feedback separately. The number of PNs participating in our study was too small to compare PNs receiving only video-feedback (i.e. the web-enabled link) with PNs receiving video-feedback including the face-to-face session and/or the written report. Furthermore, although our study showed that a single video-feedback session can lead to significant improvement of communication skills and small improvement of some MI skills, long-term effects have yet to be investigated.

Outcome measures

In this thesis no outcome measures on patient's lifestyle behaviour were included. This could be interpreted as a limitation. However, the aim of our study was to examine and improve professionals' lifestyle counselling in routine practice, with the communication skills, clinical competence and motivational interviewing skills of GPs and PNs as intermediate outcome measures, which holds the promise of better patient outcomes with respect

to behaviour change given the results of earlier studies. Besides, drawing conclusions about the causality of the effect of lifestyle counselling on patient outcomes, while the counselling techniques (i.e. MI skills) are not adequately implemented is not sound, since there is a significant risk of a type III error, i.e. evaluating an intervention that has not been adequately implemented [18,19]. Furthermore, patients' opinion about discussing their lifestyle behaviour was not assessed. Nevertheless, previous research suggests that 78% of the patients think that it is within the GPs' task description to provide unsolicited advice to patients about their lifestyle behaviour [20]. Additionally, we were not aware of the actual lifestyle behaviour of the patient in the GP-study, except when it was discussed during the consultation. Patients of the PN-study did report on their current lifestyle behaviour in a questionnaire (about smoking, physical activity and alcohol use). It is important to be aware of patients' lifestyle behaviour, since previous research [21] showed that many patients with diabetes type 2 misperceive their healthy lifestyle behaviours (i.e. fruit, vegetable and fat consumption and physical activity), which could hinder lifestyle changes. Future research should address outcomes on patient's lifestyle behaviour. Finally, the significant differences and effects found in our studies as described in this thesis were relatively small and limited. The clinical relevance and robustness of our findings need to be replicated in future studies.

General discussion

In this discussion section the main results of this thesis will be compared with relevant literature and theory and discussed in a broader context.

Theoretical reflections

As described in the I-change model [22,23], behaviour change can be distinguished in three phases: awareness, motivation and action (see Chapter 1). It is expected that people gain knowledge on and awareness of their own unhealthy lifestyle behaviour through different information channels (e.g. primary care providers) and will become motivated to change that behaviour. In theory, intentions and action plans are formulated next and translated into actual behaviour change and maintenance. Therefore, for this thesis the following 'lifestyle counselling' techniques were examined: Motivational Interviewing (raising awareness, increasing intrinsic motivation, guiding towards behaviour change, overcoming barriers and action planning), tailored to the Stages of Change (raising success rates by tailoring to different motivational phases of behaviour change), and tailoring information and advice to individual patients (raising success by tailoring to personal and social-environmental factors, as observed during the consultation). We hypothesized that healthcare providers performing these lifestyle counselling techniques (within patient's stage of change) are guiding patients towards behaviour change, from awareness to action and maintenance of behaviour, representing the three phases of the I-Change model. However, preceding factors (e.g. biological, social and cultural factors) and informational factors (i.e. quality of the message, channels and sources used), which are also part of the I-Change Model, were only taken into account to some extent (i.e. we controlled for patient characteristics, consultation length and clustering of the data if possible, and took the quality of the provided communication into account). Other contextual or environmental factors, as for example the (non) reimbursement of stop smoking advice (social-environmental factor) or the familiarity of the provider with the patients' social context and disease [15], were not taken into account, but could have influenced the outcomes on providers' performance of lifestyle counselling. According to Michie et al [24], intrapersonal and environmental perspectives are, however, equally important as a way to influence behaviour change.

Implementation of MI in routine practice

Our study showed that GPs and PNs rarely use MI techniques during consultations in which lifestyle behaviour is discussed (Chapter 4,5). Previous, small-scale studies among primary care nurses found similar outcomes. Heinrich [19] found a limited use of MI among PNs in diabetes care, Voogdt-Pruis [25] concluded that within cardiovascular prevention PNs should pay more attention to MI, and Efraimsson and colleagues [26] demonstrated that nurses rarely used MI techniques in their smoking cessation communication with patients. Studies among GPs implementing MI are less common and often based on self-evaluation of their MI skills [27,28]. However, a recent study by Sonntag and colleagues [29] demonstrates that German GPs seldom use MI techniques during their consultations with obese patients. Furthermore, another study concluded that doctors use very few motivational techniques during routine consultations with diabetes patients [30]. Apparently, using MI during routine consultations in primary care is no standard practice (yet).

Previous studies in diabetes care suggest that time pressure and the dominance of biomedical aspects during consultations are barriers for implementing MI [19,31]. More specifically, it is possible that adhering to quality indicators based on clinical guidelines during consultations is an impediment to the use of MI [32]. Such quality indicators may be part of financial incentive and reimbursement systems and therefore demand PNs and GPs to meet certain task requirements, but GPs and PNs also need to take the patients' motivation into account as part of MI. Others also indicate the possible tension between guidelines and patient-centred communication [33] or between guidelines and the context of the patient who visits the general practice [34]. Besides, there are studies that suggest that some patients lack the motivation to visit the practice and to show up on follow-up visits [35] or change their lifestyle behaviour [35,36]. It is possible that MI is not applicable during every consultation nor for every patient [19] or for every lifestyle behaviour. Van Dillen et al [37] indeed pointed out that GPs pick either the confrontational or motivational style to communicate about overweight, but stick to a motivational style when discussing nutrition in general. In our study difficulties in applying MI techniques in routine practice can also be due to differences in the content and extensiveness of the MI training prior to our study (i.e. prior MI training varied between one half day to six half days).

Skill mix of GPs and practice nurses in primary care

The present study demonstrated that both GPs and PNs somehow perform lifestyle counselling according to generally acknowledged criteria (Chapter 4). Furthermore, our systematic literature review showed that GPs and nurses are equally equipped to provide lifestyle counselling (Chapter 2). This is comparable with other studies that suggest that care from GPs and nurses results in similar patient outcomes [38-40]. However, as mentioned before, PNs (can) spend more time on counselling patients compared to GPs and during the education and training of nurses there is more emphasis on patient education, lifestyle and disease prevention [38,41]. GPs, on the other hand, may traditionally be considered to have more authority to deliver care to patients. It is not clear if this also applies to GPs' delivery of preventive care. Furthermore, a study of Voogdt-Pruis [25] showed that nurses adhere better to the Dutch cardiovascular guideline and provide more often lifestyle advice compared to GPs. The current study also found that PNs, in general, adhere to clinical practice guidelines to a great extent (Chapter 8). However, we did not compare this with GPs' adherence to guidelines. Moreover, previous research suggests that nurses are facilitators of the implementation of cardiovascular prevention by assisting GPs [35]. Therefore, the already existing skill mix of GPs and PNs in primary care seems optimal; GPs diagnose and initiate treatments and lifestyle counselling, whereas PNs monitor treatment outcome, provide education and support for behaviour change, and offer follow-up contacts. Patients also appreciate these 'complimentary tasks' of GPs and PNs [42]. However, the optimal skill mix should always be a reflection of the (local) demand for care.

Furthermore, since GPs and PNs may be expected to be aware of the social context of the patient and available facilities and lifestyle programmes in the neighbourhood, they could tailor their advice and information to the needs and wishes of the individual patient. However, our study showed that there is room for improvement in the amount of tailoring of information and advice (Chapter 4) and tailoring to patient's current stage of change (Chapter 6). A potentially worthwhile task delineation in this respect may be that GPs provide generic information about lifestyle to patients, followed by specific information and advice provided by PNs. The added value of this strategy has yet to be investigated.

Improve transfer from research to practice

Overall, our results suggest that schooling and post-educational training in lifestyle counselling and MI are no sufficient guarantees for the actual application of these tools. This is in conformity with previous studies [19,43-45]. Furthermore, other studies also demonstrate that primary healthcare providers feel the need for schooling in lifestyle counselling and MI [2,46]. An important point to stress is that the GPs and PNs who participated in the current study did not show poor communication skills in general. Nevertheless, a single session of video-feedback (Chapter 7) already resulted in significant improvement of several communication skills and some MI skills (i.e. 'agenda setting and permission seeking') in PNs (Chapter 8). It is possible that a basic level of MI knowledge (i.e. prior schooling or training in MI) is needed to increase the effect of individual feedback. So far, it is unknown how much and which training is actually needed for MI and lifestyle counselling [31,47,48]. Previous research among physicians suggest that the most effective feedback is systematic feedback provided over a number of years [49], since many practitioners tend to return to old counselling habits after a few months [43,45,50]. Furthermore, there are indications that training should include various activities such as viewing and discussing video-recorded consultations, role-play and discussing case examples [51-53], as we did in our video-feedback method (Chapter 7,8). Though additional training might strengthen and maintain the new counselling skills, training needs to focus on enhancing new counselling behaviour consistent with MI and suppressing old counselling behaviour that is inconsistent with MI [19]. Yet, enhancing new counselling skills is easier than alter prior counselling habits [43]. Furthermore, all members of a medical practice need to be motivated to change and to have a shared understanding of the meaning of an approach [45]. Besides, it is important that health care providers are supported by their supervisor(s) [33,54] and colleagues [30,55]. Consequently, it is essential to ensure that the training is correctly implemented in routine practice (to safeguard the 'transfer' from knowledge to practice and onwards) [54,56,57] and to examine what hinders and facilitates this process, by means of video-observation research [57].

Recommendations for future research

So far, the main findings of the studies are summarized, findings are discussed in light of relevant literature and methodological reflections are described. Next, some recommendations for future research in this area will be presented.

First, future studies are needed to examine the effects of MI, (generic/tailored) information and advice by GPs and PNs on the fulfilment of patients' needs and on health outcomes. So far, the evidence of MI as an effective strategy for chronic diseases and lifestyle counselling is limited [1,19,25,58] (see also Chapter 2). This is in contrast to previous studies using MI as an effective strategy in addictive behaviours, more specific on problem drinkers and for smoking cessation [48]. As pointed out by Heinrich [19] and by Resnicow and colleagues [58] MI in chronic disease and lifestyle counselling may require a different approach than MI in addictive behaviours. Future research could elaborate on this. Additional research is also needed into immediate, intermediate and long-term outcomes (or so called 'endpoints') of lifestyle counselling and MI, as distinguished by the 'six function model of medical communication' of De Haes and Bensing [59]. The endpoints may relate to the patient, the healthcare provider or the context. For example, an immediate endpoint on the part of the healthcare provider could be that the motivation of the patient is discussed, whereas an intermediate endpoint on the part of the patient could be his or her lifestyle behaviour and on the long-term his or her health and quality of life [59].

Furthermore, more insight is needed in how to adapt MI to patient's individual stage of change (Chapter 6), and what the effects are on patient outcomes. Therefore, underlying working mechanisms of the behaviour change techniques (providing information, advice and MI) should be unravelled (Chapter 2). Whereas previous research did detect some processes underlying MI (e.g. strength of commitment at the end of a session predicts behaviour change) [60], more research is needed to detect all underlying working mechanisms and to replicate previous findings. This is also essential to gain more insight into possible implementation determinants [61] of lifestyle counselling and MI.

If MI and tailoring of information and advice prove to be effective for patient outcomes and needs with respect to lifestyle behaviour, then research could further focus on how to integrate MI and lifestyle counselling in routine

primary care consultations of GPs and PNs, while simultaneously complying with the many other clinical demands. Therefore, barriers and facilitators for the implementation of lifestyle counselling in routine primary care need to be examined, by observing the interaction between patients and providers and by actually exploring both providers' and patients' preferences and experiences. In line with a recent study in type 2 diabetes [19], we recommend that future research focuses on adequate training and skill levels for primary care providers for application of MI and lifestyle counselling during routine consultations. Furthermore, more large-scale studies into the implementation of MI and lifestyle counselling in routine practice of GPs and PNs are needed. Further studies should also examine lifestyle counselling with respect to the participation of patients during routine consultations about lifestyle behaviour, their ability and performance of self-management and adherence to lifestyle behaviour changes. Furthermore, patients should explore their own contribution to changes in their behaviour. The Dutch government also stresses the importance of patient's own responsibility and self-management towards their health and behaviour [62,63]. In addition, more insight is needed in how to make lifestyle counselling and MI part of guidelines, protocols and competence profiles of GPs and PNs, in an optimal way. Besides, it may be useful to examine when GPs or PNs deviate from guidelines or protocols and their reasons to do so [63]. Finally, more research is needed into the way primary care providers can align lifestyle counselling with the needs of the individual patient.

Implications for practice

Finally, the implications for primary healthcare practice will be outlined.

It is important to stress that before MI and lifestyle counselling become part of vocational training, guidelines, protocols and competence profiles, and before these techniques will be adequately implemented in routine practice (as recommended below), it is necessary to ensure that these are indeed effective strategies to change and maintain healthy lifestyle behaviour in patients, resulting in positive health outcomes in concordance with patients' needs. Therefore, first more research on patient outcomes and needs related

to MI and lifestyle counselling of GPs and PNs is needed (see recommendations for future research).

Lifestyle counselling and MI in vocational training

Nowadays, MI or 'behaviour change counselling' is part of the education of PNs in the Netherlands [64]. As of 2013, MI will also be integrated in the education of Dutch GPs [5]. During their education, special attention needs to be paid to barriers and facilitators to perform MI and lifestyle counselling, taking into account the transfer from education to clinical practice. The government has recommended, in their 2013 policy agenda, to invest in the education of GPs and task delegation to specialised nurses and physician assistants [62]. It is, however, not clear if and to what extent lifestyle counselling and MI are part of this investment, and if PNs are included in the policy measures (i.e. only specialised nurses and physician assistants are explicitly mentioned).

Lifestyle counselling and MI in tailored CME

The results of our study confirm that lifestyle counselling and MI are no standard practice during routine consultations (yet). Hence, it is recommended that lifestyle counselling and MI not only become part of the vocational education of GPs and PNs, but also of their Continuing Medical Education (CME), for example by means of annual boosters sessions. In addition, video-feedback and peer review by colleagues can strengthen the training effect, i.e. by means of supporting each other and eliciting a shared understanding of the counselling approach.

Lifestyle counselling and MI in guidelines, protocols and competence profiles

To some extent, lifestyle counselling is already part of guidelines, protocols and competence profiles of GPs and PNs. However, lifestyle counselling is mainly incorporated into disease specific guidelines or standards, as for example the Dutch College of General Practitioners' (DCGP) guidelines and health standards on Diabetes type 2 or COPD, which provide very general recommendations for lifestyle behaviour. Fortunately, the DCGP has recently developed standards to 'stop smoking' [65] and for people with obesity [66], which are aimed at lifestyle behaviour change. Furthermore, the 'prevention consultation' (another DCGP standard) is developed to efficiently guide patients from 45 years and older with risk at heart and

vascular disease, diabetes type 2 or kidney damage [67]. If patients have an elevated risk at heart and vascular disease, diabetes type 2 or kidney damage (measured through a website), they are advised to visit the GP, PN or occupational physician, who offer patients two consultations including, if necessary, tailored lifestyle advice. Hence, GPs or PNs have a defined set of tasks to fulfil in accordance with the 'prevention consultation' standard. The National Association of General Practitioners (LHV) supports several activities with respect to preventive activities for GPs (e.g. partnerships concerning stop smoking, physical activity and obesity) [68]. So far, MI is not directly part of guidelines, protocols or competence profiles, although this technique seems to be underlying the Stop Smoking guideline [65] and does appear to be mentioned as an example of a counselling technique in the competence profile of PNs [69].

As mentioned before, both GPs and PNs use the same guidelines, although PNs also use several specific protocols which include lifestyle behaviour. However, these protocols are mainly used as a checklist of the patient's current (medical) status to justify medical healthcare costs and may therefore hamper proper performance of lifestyle counselling and MI [19]. As stated, it may be desirable that GPs provide general information about lifestyle to patients (as reflected in the guidelines of the DCGP or healthcare standards) followed by PNs' tailored information and advice. Therefore, PNs need more extensive guidelines and protocols on lifestyle counselling and MI. However, these should not be mandatory (i.e. to avoid ticking a checklist), but guiding. In addition, lifestyle counselling (general or specific, depending on the professional) and (brief) MI should be part of the competence profiles of GPs and PNs. This way, the focus of primary care providers (and public health) may gradually shift from 'care and disease' to the recently endorsed focus on 'behaviour and health' [70].

Cooperation and role delineation between professionals

Cooperation between professionals is crucial to optimize lifestyle counselling and facilitate behaviour change in patients. Not only between GPs and PNs, but also the cooperation with other professionals as dieticians and physiotherapists who also play a significant role with respect to lifestyle counselling [46,71]. Therefore, responsibilities of the different professionals should be clearly formulated and not overlap [64]. Furthermore, GPs and PNs should be aware of the local availability of lifestyle interventions and programmes [36,46]. A website that includes the local supply of physical

activity interventions or programmes is already developed for primary care professionals (www.actiefadvies.nl). Websites (or other tools, e.g. leaflets or schedules) with the local availability of interventions or programmes with respect to healthy nutrition, smoking cessation and alcohol use are, to the best of our knowledge, not (yet) available.

The government and the National Association of General Practitioners (LHV) have agreed that GPs play a vital role in the development of more healthcare initiatives in the neighbourhood ('zorg in de buurt') in 2013 [62].

Reinforce patient's responsibility and self-management

Although the performance of lifestyle counselling and MI by GPs and PNs should be strengthened, patients also have their own responsibility towards their lifestyle behaviour. Therefore, patients' responsibility and self-management skills ought to be reinforced by using MI and lifestyle counselling. However, for some patients or in some situations (e.g. not motivated patients) self-management may be very difficult and more guidance and support from professionals is needed [2]. The website of the 'prevention consultation' helps patients (of 45 years and older) to assess their own lifestyle behaviour and provides practical advice tailored to the individual patient (www.testuwleefstijl.nl), including the recommendation to visit a primary care provider or other professional in case of an elevated risk.

As mentioned before, the Dutch government also stresses the importance of patient's own responsibility and self-management towards their health and behaviour [62,63]. Therefore, it may be possible to encourage patient's individual responsibility through several canals (instead of public media campaigns), as in education, work, traffic, living and recreation.

A final remark: there are various good initiatives to foster behaviour change. It would be helpful if these initiatives converge to take the care of patients to the next level, in order to better help patients change and maintain their health behaviour.

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Samenvatting (Summary in Dutch)

Samenvatting (Summary in Dutch)

In dit proefschrift is onderzocht hoe huisartsen en praktijkondersteuners tijdens hun dagelijkse consultvoering communiceren over het leefstijlgedrag van patiënten, met betrekking tot roken, alcohol, bewegen en voeding. Daarbij is specifiek gekeken naar het toepassen van motiverende gespreksvoering ('motivational interviewing') door huisartsen en praktijkondersteuners, om patiënten aan te zetten tot gedragsverandering. De overkoepelende term, die in dit proefschrift gebruikt wordt, is 'leefstijl counseling'. De volgende onderzoeksvragen zijn beantwoord:

Deel I (literatuurstudie):

- 1a. Wat is er bekend in de literatuur over effectieve *face-to-face* communicatiegerelateerde gedragsveranderingstechnieken die gebruikt zijn in interventies om het leefstijlgedrag van patiënten te beïnvloeden, met betrekking tot roken, alcohol, voeding, gewicht en bewegen?
- 1b. Welke eerstelijnszorgverlener, huisarts of verpleegkundige, is volgens de literatuur het meest effectief in het gebruik van communicatiegerelateerde gedragsveranderingstechnieken?

Deel II (observationale studies):

2. Hoe communiceren huisartsen en praktijkondersteuners over het leefstijlgedrag van patiënten en in hoeverre maken ze gebruik van motiverende gespreksvoering, tijdens hun dagelijkse consultvoering?

Deel III (feedback studies):

- 3a. Is video-feedback een bruikbare en geaccepteerde methode om te reflecteren op communicatievaardigheden, volgens huisartsen?
- 3b. Wat is het effect van video-feedback op de communicatievaardigheden, klinische vaardigheden en motiverende gespreksvoering vaardigheden van praktijkondersteuners?

In de **algemene inleiding** van dit proefschrift (**Hoofdstuk 1**) wordt de noodzaak tot (een verbetering in) leefstijl counseling in de eerste lijn gegeven, en worden de theoretische achtergrond en het theoretisch kader gepresenteerd. Het 'Integrated Model for Change' (I-Change (2.0) model) van De Vries (2008) is gehanteerd als voornaamste theoretisch kader. De focus van het I-Change model ligt op intrapersonlijke determinanten van

gedrag (zoals intentie en motivatie), zonder de invloed van omgevingsfactoren te negeren (zoals familie of beleid).

Belangrijkste bevindingen

Deel I: Effectieve *face-to-face* communicatiegerelateerde gedragsveranderingstechnieken

In het eerste deel van deze thesis, **Hoofdstuk 2**, is een systematisch literatuuronderzoek uitgevoerd naar de relatieve effectiviteit van communicatiegerelateerde *face-to-face* gedragsveranderingstechnieken die gebruikt zijn in interventies om het leefstijlgedrag van patiënten te beïnvloeden. Daarnaast wordt in dit hoofdstuk beschreven welke eerstelijnszorgverlener, huisarts of verpleegkundige, volgens de literatuur het meest effectief is in het toepassen van deze communicatiegerelateerde gedragsveranderingstechnieken. In totaal zijn 50 studies geïnccludeerd, waarvan de methodische kwaliteit is geëvalueerd. Zesentwintig studies rapporteerden significante positieve gezondheidsuitkomsten naar aanleiding van de gebruikte gedragsveranderingstechniek(en) én leverden genoeg empirisch bewijs volgens een 'best evidence synthese'. De resultaten laten zien dat 'behavioural counseling', motiverende gespreksvoering, educatie en advies allen potentieel effectieve *face-to-face* communicatiegerelateerde gedragsveranderingstechnieken zijn. Het was echter niet mogelijk om de onderliggende werkingsmechanismen van deze technieken te achterhalen, die wellicht cruciaal zijn voor de effectieve uitkomsten bij patiënten. Daarbij werden deze technieken ook gevonden in minder succesvolle studies, vanwege verschil in bijvoorbeeld de opzet van de studie, de patiënten populatie, en in mindere mate de kwaliteit van de studies. Tot slot blijkt uit de literatuur dat huisartsen en verpleegkundigen even vaardig zijn in het toepassen van communicatiegerelateerde gedragsveranderingstechnieken.

Deel II: Observationele studies in de eerste lijn; de rol van zorgverleners

In het tweede deel van dit proefschrift ligt de focus op cross-sectioneel observationeel onderzoek. In hoofdstuk drie tot en met zes wordt beschreven hoe huisartsen en praktijkondersteuners communicatievaardigheden en motiverende gespreksvoering vaardigheden toepassen bij het uitvoeren van 'leefstijl counseling', tijdens hun dagelijkse consultvoering.

Hoofdstuk 3 onderzoekt of gezonde en ongezonde leefstijl keuzes van patiënten heden ten dagen meer besproken worden in huisartsconsulten dan voorheen. Observaties van dagelijkse consulten tussen huisartsen en patiënten in de periode van 1975 tot 2008 zijn gebruikt. Tevens is het type benadering van huisartsen tot het bespreken van leefstijlgedrag onderzocht. Daarbij is een onderscheid gemaakt tussen de ‘populatie benadering’, ‘hoogrisico benadering’ en ‘symptoom benadering’. De ‘populatie benadering’ heeft betrekking op het bespreken van leefstijlgedrag met alle patiënten, de ‘hoogrisico benadering’ omvat het bespreken van leefstijlgedrag met patiënten met een (verhoogd risico op een) chronische ziekte en de ‘symptoom benadering’ refereert aan het bespreken van leefstijlgedrag met patiënten wanneer dit relevant is voor de gepresenteerde klacht, zonder dat de patiënt een verhoogd risico loopt of een chronische ziekte heeft (bijvoorbeeld, vragen naar rookgedrag wanneer de patiënt hoest). Verder is onderzocht of het bespreken van leefstijlgedrag gerelateerd is aan patiëntkenmerken, zoals geslacht, leeftijd en opleiding.

Deze studie laat zien dat het bespreken van rookgedrag en bewegen enigszins is toegenomen over de tijd. Dit geldt niet voor het bespreken van voeding (diëten) en alcoholgebruik. In totaal werd het leefstijlgedrag van de patiënt echter in een minderheid van de consulten besproken. Alcoholgebruik van de patiënt werd het minst frequent besproken en bewegen kwam het vaakst aan bod tijdens huisartsconsulten. Huisartsen blijken vooral het leefstijlgedrag van de patiënt te bespreken wanneer dit relevant is voor de klacht van de patiënt (symptoom benadering) en leefstijlgedrag niet met elke patiënt (d.w.z. geen populatie benadering) te bespreken. Tot slot vonden we dat leefstijlgedrag meer wordt besproken met oudere, mannelijke patiënten (behalve als het over voeding gaat). Er werden geen verschillen gevonden tussen patiënten met een verschillende opleiding. Een uitzondering hierop was het bespreken van beweeggedrag, dit werd meer besproken in consulten met patiënten met een HBO of universitaire opleiding.

In **Hoofdstuk 4** is beschreven hoe huisartsen (n=39) en praktijkondersteuners (n=19) leefstijl counseling toepassen, in termen van het geven van informatie en advies over leefstijl en het toepassen van motiverende gespreksvoering. Hiervoor werden respectievelijk 124 en 141 consulten geselecteerd, waarin werd gesproken over het leefstijlgedrag van de patiënt. Het geven van informatie en advies was onderverdeeld in specifiek (‘tailored’) en generiek, respectievelijk meer of minder

patiëntgericht.

In dit hoofdstuk komt naar voren dat zowel huisartsen als praktijkondersteuners leefstijlcounseling toepassen tijdens hun dagelijkse consulten, volgens algemeen geaccepteerde criteria. Informatie over leefstijl werd meestal gegeven in generieke termen door huisartsen en praktijkondersteuners. Advies over leefstijl werd in het algemeen niet veel gegeven aan patiënten. Wanneer praktijkondersteuners advies gaven aan patiënten over hun leefstijlgedrag dan was dit meestal specifiek advies gericht op een bepaalde patiënt en diens situatie. Huisartsen gaven zowel specifiek als generiek advies. Advies over rookgedrag was meestal specifiek van aard. Huisartsen pasten nauwelijks motiverende gespreksvoering toe tijdens consulten over gedragsverandering van de patiënt. De huisartsen waren echter (op één na) niet getraind in motiverende gespreksvoering. Praktijkondersteuners, die wel getraind waren in motiverende gespreksvoering, paste deze techniek enigszins toe tijdens hun consulten over gedragsverandering van de patiënt.

Hoofdstuk 5 beschrijft dat ervaren praktijkondersteuners (n=13) die extra training hebben gehad in motiverende gespreksvoering voorafgaand aan deze studie, moeite hebben met het toepassen van deze manier van gespreksvoering tijdens alledaagse consulten (n=117). De praktijkondersteuners pasten motiverende gespreksvoering enigszins toe tijdens hun consulten, maar met een substantieel verschil tussen de verschillende motiverende gespreksvoering items. Er werd geen verschil gevonden in het toepassen van motiverende gespreksvoering vaardigheden tussen primaire en secundaire preventie consulten. Een mogelijke verklaring voor het gebrek aan verschil tussen de twee typen preventie consulten is wellicht dat de te behalen winst door het voorkomen van complicaties in primaire preventie gelijk is aan de noodzaak om verergering van een ziekte te voorkomen in secundaire preventie.

In **Hoofdstuk 6** wordt het toepassen van motiverende gespreksvoering vaardigheden, algemene communicatievaardigheden en klinische communicatievaardigheden door praktijkondersteuners, binnen de fase van gedragsverandering van de patiënt ('Stage of Change') geanalyseerd. Daarbij is onderscheid gemaakt tussen 1) de precontemplatie- en contemplatiefase, 2) de voorbereidende fase en 3) de actie- en onderhoudsfase van gedragsverandering.

Praktijkondersteuners passen hun motiverende gespreksvoering vaardigheden enigszins aan aan de fase van gedragsverandering van de

patiënt. De resultaten laten zien dat, gemiddeld genomen, praktijkondersteuners hun motiverende gespreksvoering vaardigheden meer aanpassen aan patiënten in de voorbereidende fase dan aan patiënten die op dat moment in een andere fase van gedragsverandering zitten (precontemplatie, actie of onderhoud). Praktijkondersteuners passen drie specifieke motiverende gespreksvoering vaardigheden en één algemene communicatievaardigheid aan aan de fase van gedragsverandering van de patiënt. Deze exploratieve studie laat zien dat praktijkondersteuners enigszins intuïtief de fase van gedragsverandering van de patiënt achterhalen en hun communicatie daar op aanpassen. Echter, de verschillen tussen de fasen van gedragsverandering waren klein.

Deel III: Effecten van video-feedback op de communicatievaardigheden en motiverende gespreksvoering vaardigheden van zorgverleners.

Het derde deel van deze thesis bestaat uit feedback studies.

In **Hoofdstuk 7** is de video-feedback methode beschreven, die is ontwikkeld om te kunnen reflecteren op de communicatievaardigheden van ervaren huisartsen. Allereerst kregen huisartsen (n=28) een persoonlijke, beveiligde web-link naar twee van hun eigen op video opgenomen consulten. Nadat zij deze consulten hadden bekeken kregen zij feedback over de telefoon of in een één op één mondelinge sessie van een uur, gestructureerd aan de hand van een individueel rapport. Dit rapport bevatte scores over de communicatie van de huisarts in vergelijking met collega huisartsen en scores over de eigen communicatie uit een eerdere studie. De mening van patiënten over de communicatie van hun huisarts werd eveneens opgenomen in het rapport. Aan huisartsen werd gevraagd te reflecteren op hun eigen communicatie en een mening te geven over het nut en de bruikbaarheid van de feedback (methode).

Bijna alle huisartsen waren tevreden over de feedback (methode), met name over de web-link naar de op video-opgenomen consulten en het gestructureerde rapport. Feedback over de telefoon of in een één op één mondelinge sessie werden gelijk gewaardeerd.

Hoofdstuk 8 onderzoekt de effecten van individuele video-feedback, vergelijkbaar met de methode beschreven in hoofdstuk 7, op de algemene communicatievaardigheden, klinische competenties (d.w.z. het houden aan richtlijnen en standaarden) en motiverende gespreksvoering vaardigheden van ervaren praktijkondersteuners (n=17), door middel van een voor- en nameting met controlegroep. Ten eerste werden 325 consulten tussen

praktijkondersteuners en patiënten opgenomen op video op twee momenten (T0 en T1), met 3 tot 6 maanden ertussen. Vervolgens werden deze consulten geobserveerd met behulp van twee gevalideerde observatie-instrumenten en geanalyseerd met multilevel regressie analyse. Voor de video-opnamen van de consulten werden praktijkondersteuners toegewezen aan de video-feedback groep of controlegroep. Praktijkondersteuners uit de video-feedback groep kregen video-feedback tussen T0 en T1. Praktijkondersteuners uit de controlegroep kregen video-feedback na afloop van de studie (d.w.z. na T1).

Video-feedback blijkt een potentieel effectieve methode om de algemene communicatievaardigheden van praktijkondersteuners te verbeteren. Praktijkondersteuners die video-feedback ontvingen hadden significant meer aandacht voor de hulpvraag van de patiënt en gaven meer uitleg over het medisch onderzoek in de spreekkamer (bijvoorbeeld over de bloeddrukcontrole). Daarnaast gaven deze praktijkondersteuners significant meer begrijpelijke informatie in vergelijking met praktijkondersteuners uit de controlegroep. Bovendien evalueerden de praktijkondersteuners de feedback (methode) als nuttig. Alhoewel een eenmalige video-feedback sessie niet genoeg lijkt om de motiverende gespreksvoering vaardigheden van praktijkondersteuners te verbeteren, waren er wel significante verbeteringen te zien op enkele specifieke motiverende gespreksvoering vaardigheden. Praktijkondersteuners uit de video-feedback groep besteden significant meer aandacht aan 'agenderen en toestemming vragen' tijdens hun consultvoering dan praktijkondersteuners uit de controle groep. Tot slot laat deze studie zien dat de klinische vaardigheden van praktijkondersteuners, oftewel het opvolgen van richtlijnen, niet veranderden na de feedback, doordat praktijkondersteuners al heel hoog scoorden op deze vaardigheden voorafgaand aan de feedback (plafond effect).

In het laatste hoofdstuk van dit proefschrift, de **samenvatting en algemene discussie**, wordt op de belangrijkste bevindingen gereflecteerd in het kader van eerdere studies en theorie. Daarnaast wordt een methodologische reflectie gegeven en worden aanbevelingen gedaan voor onderzoek en voor de praktijk.

Appendixes

Appendix 1 Search Strategy PubMed

Search Strategy PubMed dd. 11-10-2010

Search	Search Terms	Results
#1	"Life Style"[Majr] OR "lifestyle"[tiab] OR "healthy behavior" [tiab] OR "healthy behaviour"[tiab] OR "health behavior"[tiab] OR "health behaviour"[tiab] OR "unhealthy behavior" [tiab] OR "unhealthy behaviour"[tiab]OR "behavior change"[tiab] OR "behaviour change"[tiab]OR smoking[tiab] OR alcohol [tiab] OR nutrition[tiab] OR "eating habits"[tiab] OR "physical activity" OR "Exercise"[Majr] OR exercise [tiab] OR "Alcohol Drinking"[Majr] OR "Smoking"[Majr] OR "Eating"[Majr]	545534
#2	"Communication"[Majr] OR "Communication"[tiab] OR "advice"[tiab] OR "Health Education"[Mesh] OR "health education"[tiab] OR "Counseling"[Mesh] OR "counseling"[tiab] OR "Health Promotion"[Mesh]OR "health promotion"[tiab] OR intervention [tiab] OR prevention [tiab]	887763
#3	"Primary Health Care"[Mesh] OR "primary care" [tiab] OR "Primary Nursing Care"[Mesh] OR "Physicians, Family"[Mesh] OR "family physician" [tiab] OR "family physicians" [tiab] OR "general practitioner" [tiab] OR "general practitioners" [tiab] OR "primary physician"[tiab] OR "primary physicians" [tiab] OR "family doctor"[tiab] OR "family doctors" [tiab] OR "practice nurse" [tiab] OR "practice nurses" [tiab] OR "Nurse Practitioners"[Mesh] OR "Nurse Practitioner"[tiab] OR "nurse practitioners"[tiab]	144152
#4	"HIV"[Mesh] OR "Neoplasms"[Mesh] OR "cancer"[tiab] OR "Mental Health"[Mesh] OR "Review" [Publication Type]	3653987
#5	#1 AND #2 AND #3 NOT #4	3856

Tiab, title and abstract; Majr, major mesh term; Mesh, mesh term

Search #5 was selected and 3856 references were included in the original literature list

Appendix 2 Operationalization of criteria for assessment of methodological quality

Validity criteria (yes, no, unclear):

1. Was the method of randomization adequate*?
2. Was the treatment allocation concealed?
3. Were the groups similar at baseline regarding the most important prognostic indicators?
4. Was the patient blinded to the intervention?
5. Was the care provider blinded to the intervention?
6. Was the outcome assessor blinded to the intervention?
7. Were co-interventions avoided or similar?
8. Was the compliance acceptable in all groups?
9. Was the drop out rate described and acceptable?
10. Was the timing of the outcome assessment in all groups similar?
11. Did the analysis include an intention-to-treat analysis?

Methodological quality:

High quality: the study adequately fulfilled 50% or more of the validity criteria (6 or more out of 11 criteria)

Low quality: the study fulfilled less than 50% of the validity criteria (<6 out of 11 criteria)

Operationalization of the criteria list

1. Was the method of randomization adequate, e.g. at patient level? Examples of adequate methods are computer generated random number table and use of sealed opaque envelopes. Score yes if the above is the case. Score no if a transparent system is used and score don't know when the method of randomization is not described in the article.

2. Was the assignment generated by an independent person not responsible for determining the eligibility of the patients? This person has no information about the persons included in the study and has no influence on the assignment sequence or on the decision about the eligibility of the patients.

Score yes when the assignment has been taken place by an independent person. Score no if the above is not the case and score don't know if no information is given about who generated the assignment.

3. Are important prognostic indicators assessed at baseline? Are there no substantial differences between the intervention group and the control group (for example regarding age, sex, type of cancer, duration of the disease, stadium of the disease, cognitive status and type of treatment).

Score yes if the above is the case and score no if there are differences regarding the prognostic indicators at baseline that could undermine post intervention differences. Score also no if no testing has been done to check if there were actual differences (a table with prognostic indicators without explanation is not enough). Score don't know when no information had been given about prognostic indicators.

4. Was the patient blinded to the intervention? The reviewer determines if enough information is given in order to score a 'yes'. Score don't know if no information is given.

5. Was the care provider blinded to the intervention? The reviewer determines if enough information is given in order to score a 'yes'. Score don't know if no information is given.

6. Was the outcome assessor blinded to the intervention? The reviewer determines if enough information is given in order to score a 'yes'. Score don't know if no information is given.

7. Were co-interventions avoided in the design or were they similar between the intervention groups and control group? Score yes if the above is the case. Score no if there were co-interventions, not similar for the different groups. Score also no when no information has been given about co interventions (so, not tested is also no).

Note. This criterion cannot be decisive in determining low quality of an article.

8. Was the compliance rate among patients evaluated (e.g. did they view the received video or read the written material)? Score yes if the percentage of patients that used the intervention is above 70% in all groups. Score no if this percentage is below 70% and score don't know if no information about compliance has been given.

9. Is the number of patients described (and reasons given) that were included in the study but did not complete the intervention or were excluded from analysis? Is this percentage of withdrawals or drop-outs acceptable? Score yes if there is information from 80–100% of the randomized patients about the outcome assessment of recall. Score no if there is information from less than 80% of the randomized patients and

score don't know if no information about withdrawals or drop-outs has been given.

10. Was the timing of the outcome assessment in all groups similar? Score yes if the above is the case (score also yes if a range is described, provided that this range does not have a large spread, for example more than three months). Score no if the timing of outcome assessment was not similar for all groups and score don't know if no information about the timing was given.

11. Was all available data included for analysis (intention to treat)? This means that all randomized patients were analyzed in the group they were assigned to regardless of noncompliance and co-interventions. Score yes if the above is the case, score no when the analysis did not include an intention to treat analysis. Score don't know if no information about intention to treat is given.

*In line with The Cochrane Collaboration, we considered trials with adequate randomization to be randomized controlled trials (RCTs). Adequate randomization approaches include: computer-generated random numbers, random numbers tables, coin toss or die toss. Alternation, case record numbers, birth dates, week days or month of the year are considered as inadequate randomization approaches [106].

Appendix 3 Principles of the best evidence synthesis

Evidence:

Provided by consistent, statistically significant findings in outcome measures in at least two high quality RCTs.

Moderate evidence:

Provided by consistent, statistically significant findings in outcome measures in at least one high quality RCT and at least one moderate or low quality RCT.

Limited evidence:

Provided by statistically significant findings in outcome measures in at least one high quality RCT.

Indicative findings:

Provided by statistically significant findings in outcome measures in at least one moderate or low quality RCT (in the absence of high quality RCTs)

No/insufficient evidence:

If the number of studies that have significant findings is less than 50% of the total number of studies found within the same category of methodological quality and study design.

Or

In case the results of eligible studies do not meet the criteria for one of the above stated levels of evidence.

Or

In case of conflicting (statistically significantly positive and statistically significantly negative) results among RCTs.

Or

In case of no eligible studies.

Appendix 4 The Behaviour Change Counselling Index (BECCI)

Domain 1: Agenda setting and permission seeking

1. The practitioner invites the patient to talk about behavior change.
2. The practitioner demonstrates sensitivity to talking about other issues.

Domain 2: The why and how of change in behavior

3. The practitioner encourages the patient to talk about current behavior or status quo.
4. The practitioner encourages the patient to talk about behavior change.
5. The practitioner asks questions to elicit how the patient thinks and feels about the topic.
6. The practitioner uses empathic statements when the patient talks about the topic.
7. The practitioner uses summaries to bring together what the patient says about the topic.

Domain 3: The whole consultation

8. The practitioner acknowledges challenges about behavior change that the patient faces.
9. When the practitioner provides information, it is sensitive to the patient concerns and understanding.
10. The practitioner actively conveys respect for the patient choice about behavior change.

Domain 4: Talk about targets

11. The practitioner and the patient exchange ideas about how the patient could change current behavior.

0 = Not at all, 1 = Minimally, 2 = To some extent, 3 = A good deal, 4 = A great extent

The practitioner talks:

Less than 50% of the time 50% of the time more than 50% of the time

Mean substitution:

1. Take the mean of all the applicable items (i.e. add up the total score of the applicable items, and divide by that number of items).
2. A technique known as 'mean substitution' is used for any items scored as 'not applicable'. The mean of the applicable items in a particular consultation is the score to be used for the not applicable items. So, for example, if the mean of all other items is 2.87, this is the score that should be given to any items scored as not applicable

Appendix 5 Lifestyle behaviour protocol

The four items below were only coded when present during a consultation and could be coded several times during one consultation, for one or more lifestyle behaviours (i.e. smoking, alcohol, physical activity and/or dietary habits).

1. General practitioner/ practice nurse provides verbal information about patient's lifestyle behaviour
 - a. generic information
 - b. tailored information
2. General practitioner/ practice nurse provides verbal advice about patient's lifestyle behaviour
 - a. generic advice
 - b. tailored advice
3. General practitioner/ practice nurse refers the patient to another professional or plans a follow-up contact
 - a. follow-up consultation about lifestyle behaviour (with GP or practice nurse)
 - b. telephone appointment about lifestyle behaviour (with GP or practice nurse)
 - c. dietician
 - d. physical activity support ('Beweegkuur')
 - e. stop smoking support
 - f. physiotherapist
 - g. psychologist
4. General practitioner/ practice nurse supplies a folder, leaflet or printed material (about)
 - a. smoking
 - b. alcohol
 - c. physical activity
 - d. healthy eating/ diet

Examples (Quotes)

Generic information:

Provider: Your cholesterol level was determined, it was 5.4 in total. That should be below five. So it is slightly elevated. Ummm, how do we get that down? Also with sufficiently physical activity, and minimize animal saturated fats. Which products do you have to avoid? Actually, all tasty food.

Patient: Yes.. that is correct.

Provider: Cookies, chips, pastry, chocolate, greasy meat, pork. And cheese is a major problem.

Tailored information:

Provider: You do not smoke anymore?

Patient: No, for two months now.

Provider: Wow, excellent! And with your job of course.

Patient: Yes, yes.

Provider: Do you notice it in your voice?

Patient: Yes, very much so. Very much. The falsetto is back.

Provider: Yes, yessss.

Patient: Yes, I notice that.

Provider: Well except that it is healthy to stop smoking for your health in general, it is with your singing quite noticeable, of course.

Generic advice:

Patient: What is recommended physical activity? Two, three times a week I thought?

Provider: Actually, five times a week, half an hour, moderately intensive. So not a little stroll, but brisk walking or hiking.

Patient: And for half an hour?

Provider: Yes, that is what we recommend.

Tailored advice:

Patient: Don't you have another advice?

Provider: To stop smoking?

Patient: Yes, well, at least to smoke not too much

Provider: I'm thinking, is it a possibility for you to say.. well, you can have a cigarette in the morning. One with your coffee, after dinner and in the afternoon with your thee?

Patient: Yes, whatever you say. But that are five cigarettes again!

Provider: Yes, but now you smoke a pack a day.

Appendix 6 MAAS-global

0 = not present, 1 = poor, 2 = unsatisfactory, 3 = doubtful, 4 = satisfactory, 5 = good, 6 = excellent, n.a. = not applicable

SECTION 1: COMMUNICATION SKILLS FOR EACH SEPARATE PHASE

1. INTRODUCTION 0 1 2 3 4 5 6

giving the patient room to tell his story
general orientation on the reason for visit
asking about other reasons for visit

2. FOLLOW-UP CONSULTATION n.a. 0 1 2 3 4 5 6

naming previous complaints, requests for help and management plan
asking about adherence to management plan
asking about the course of the complaint

3. REQUEST FOR HELP 0 1 2 3 4 5 6

naming requests for help, wishes or expectations
naming reasons that prompted the patient to come now
completing exploring request for help

4. PHYSICAL EXAMINATION n.a. 0 1 2 3 4 5 6

instructions to the patient
explanation of what is being done
treating the patient with care and respect

5. DIAGNOSIS 0 1 2 3 4 5 6

naming findings and diagnosis/hypothesis
naming causes or the relation between findings and diagnosis
naming prognosis or expected course
asking for patient's response

6. MANAGEMENT 0 1 2 3 4 5 6

shared decision-making, discussing alternatives, risks and benefits
discussing feasibility and adherence
determining who will do what and when
asking for patient's response

7. EVALUATION OF CONSULTATION 0 1 2 3 4 5 6

general question
responding to requests for help
perspective for the time being

SECTION 2: GENERAL COMMUNICATION SKILLS

8. EXPLORATION 0 1 2 3 4 5 6

exploring requests for help, wishes or expectations
exploring patient's response to information given
within patient's frame of reference
responding to nonverbal behaviour and cues

9. EMOTIONS 0 1 2 3 4 5 6

asking about/ exploring feelings
reflecting feelings (including nature and intensity)
sufficiently throughout the entire consultation

10. INFORMATION GIVING 0 1 2 3 4 5 6

announcing, categorizing
in small quantities, concrete explanations
understandable language
asking whether the patient understands

11. SUMMARIZATIONS 0 1 2 3 4 5 6

content is correct, complete
concise, rephrased
checking
sufficiently throughout the entire consultation

12. STRUCTURING 0 1 2 3 4 5 6

logical sequence of phases
balanced division of time
announcing (history taking,
examination, other phases)

13. EMPATHY 0 1 2 3 4 5 6

concerned, inviting and sincerely empathetic in intonation, gesture and eye
contact
expressing empathy in brief verbal responses

SECTION 3: MEDICAL ASPECTS

Rate according to professional guidelines if they are available.

Otherwise rate to the best of your ability.

14. HISTORY TAKING 0 1 2 3 4 5 6

15. PHYSICAL EXAMINATION n.a. 0 1 2 3 4 5 6

16. DIAGNOSIS 0 1 2 3 4 5 6

17. MANAGEMENT 0 1 2 3 4 5 6

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Curriculum Vitae

Curriculum Vitae

Janneke Noordman was born in Hilversum, The Netherlands, on November 29th 1983. She completed secondary school (VWO) at the A. Roland Holst College in Hilversum. From 2002 to 2006 she studied interdisciplinary social science at Utrecht University. During her last year as an undergraduate student she did a research internship at the Netherlands institute for health services research (NIVEL). She received the 'ASW Meesterprijs 2006' for her Master thesis: a price for the best thesis of the study interdisciplinary social science. In November 2006 she started working at NIVEL on several projects, mainly focusing on communication in healthcare between providers and patients. Since 2009 she has worked on her PhD project; in addition she has worked on another project about shared medical appointments for children and adolescents with type 1 diabetes. At the moment, she is continuing her work at NIVEL.

List of publications

List of Publications

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