

Important determinants to improve health promotion for type 2 diabetes mellitus patients

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Preface

This thesis is based upon a qualitative study conducted during January 2007– January 2008 at the Institution Beyaert Robuust Limburg. The findings of this thesis are particularly interesting for diabetes patients, professionals in diabetes care, researchers and research institutions which execute research regarding diabetes mellitus matters.

In the last phase of the master programme Health Education and Promotion, I wanted to gain more in- depth knowledge about effective health promotion interventions regarding diabetes mellitus patients and the needs and preferences of type 2 diabetes mellitus patients regarding health promotion. This subject has attracted my attention because of my work experience with diabetes mellitus patients. During execution of the research, I learned a lot about doing qualitative research.

This last period of my study has come to an end and now I want to use this page to thank a few people who made my research possible. First, I want to express my sincere gratitude to my leading supervisor Bert Vrijhoef. Without his advice and support, this thesis would never had become a reality. Furthermore, I would like to thank my second supervisor Evelien Heinrich for her help. I would also like to thank some employees of the Institution Beyaert Robuust Limburg for their support. These employees are Marianne Frederix, Elka van Summeren and Anneke van Dijk.

Finally, I would like to thank my family and friends for their constant support and interest.

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Abstract

Aim of the study: To identify determinants for including these into an instrument to measure needs, preferences and characteristics of type 2 diabetes mellitus patients regarding health promotion. By means of the instrument, knowledge of patients' needs and preferences will be obtained in order to be able to deliver integrated diabetes care. By matching patients' needs and preferences regarding health promotion activities to similar health promotion programmes, diabetes patients are expected to be motivated to perform health promotion activities and eventually a decline in human and economic burden will arise.

Methods: A thorough literature search has taken place regarding effective health promotion interventions and strategies concerning diabetes mellitus patients. In addition, face-to-face interviews are conducted among type 2 diabetes mellitus patients to elicit views and opinions concerning their needs and preferences regarding health promotion.

Results: Regarding literature search, the identified effective health promotion interventions address education, physical activity, nutrition and smoking cessation. Effective health promotion interventions are diabetes self-management education and combination strategies using dietary, physical activity and behavioural interventions. Regarding smoking cessation, effective interventions are nursing and workplace interventions and telephone counselling. Patient characteristics, which seem relevant according to literature, are Social Economic Status, educational level and cultural background. All interventions are positively connected to the outcome variable knowledge/ skills and most interventions, except smoking cessation, are positively connected to the outcome variable HbA1c-levels. The interview results indicate that type 2 diabetes mellitus patients particularly report needs and preferences regarding nutrition-based activities and physical activities.

Conclusion: Identified determinants, which will be included into an instrument to measure needs, preferences and characteristics of type 2 diabetes mellitus patients are education, physical activity, nutrition and smoking cessation. In dealing with the burden of diabetes on health care, it is important to conduct integrated and proactive health promotion programmes for diabetes mellitus patients along with the patients' needs and preferences as a starting point. These health promotion programmes are important to be able to deliver individually tailored interventions.

Samenvatting

Doel van de studie: Het identificeren van belangrijke factoren die worden opgenomen in een instrument dat in staat is om behoeften, voorkeuren en kenmerken van diabetes mellitus patiënten te meten ten aanzien van gezondheidsbevordering. Behoeften en voorkeuren van diabetespatiënten zullen met behulp van het instrument worden geïnventariseerd met de doelstelling om integrale diabeteszorg te leveren. Patiënten zullen meer gemotiveerd zijn om gezondheidsbevorderende activiteiten uit te voeren op het moment dat hun behoeften en voorkeuren ten aanzien van gezondheidsbevorderende activiteiten worden afgestemd op vergelijkbare gezondheidsbevorderende programma's. Het uiteindelijke gevolg is dat hun menselijke en economische belasting zal verminderen.

Methode: Een uitgebreid literatuuronderzoek heeft plaatsgevonden betreffende effectieve gezondheidsbevorderende interventies en strategieën met betrekking tot diabetes mellitus patiënten. Vervolgens zijn er persoonlijke interviews uitgevoerd onder diabetes mellitus type 2 patiënten. De interviews hebben tot doel om behoeften en voorkeuren van diabetespatiënten te achterhalen ten aanzien van gezondheidsbevordering.

Resultaten: Met betrekking tot het literatuuronderzoek zijn de onderzoeksresultaten onderverdeeld in effectieve gezondheidsbevorderende interventies en strategieën ten aanzien van educatie, beweging, voeding en stoppen met roken. Effectieve gezondheidsbevorderende interventies betreffen diabetes zelfmanagement educatie en gecombineerde strategieën die dietiek, lichamelijke activiteit en gedragsinterventies omvatten. Effectieve interventies gericht op stoppen met roken betreffen werkplek en verpleegkundige interventies en telefonische begeleiding. Met betrekking tot patiëntenkenmerken zijn er resultaten gevonden betreffende Sociaal Economische Status, opleidingsniveau en culturele achtergrond. Alle gezondheidsbevorderende interventies zijn positief verbonden met de uitkomstmaat kennis/vaardigheden. Behalve stoppen met roken interventies, zijn alle interventies positief verbonden met de uitkomstmaat HbA1c-waarden. De interview resultaten geven aan dat de behoeften en voorkeuren van diabetes mellitus type 2 patiënten voornamelijk liggen op het gebied van voeding en beweging.

Conclusie: De factoren die worden opgenomen in een instrument dat in staat is om behoeften, voorkeuren en kenmerken van diabetes mellitus type 2 patiënten te meten betreffen educatie, beweging, voeding en stoppen met roken. Om de gevolgen van diabetes ten aanzien van de gezondheidszorg aan te pakken is het belangrijk om patiëntgerichte, geïntegreerde en

proactieve gezondheidsbevorderende programma's uit te voeren gericht op diabetes mellitus patiënten. Deze gezondheidsbevorderende programma's zijn belangrijk om zorg op maat te leveren.

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1. Introduction

This chapter gives a description of the research topic, the research setting and the aim of the study.

1.1 Background

Diabetes mellitus, long considered as a disease of minor significance to world health, is now taking its place as one of the main threats to human health in the 21st century. The past two decades showed an explosive increase in the number of people diagnosed with diabetes mellitus worldwide (Zimmet, Alberti, & Shaw, 2001). By the end of the 20th century, the worldwide diabetes pandemic had affected an estimated 151 million persons. By the year 2025, the number of persons with diabetes mellitus is expected to increase in developed countries by 41%, from 51 to 72 million, and by 170% in developing countries, from 84 to 228 million (Engelgau, Venkat Narayan, Saaddine & Vinicor, 2003).

In the Netherlands, at about five-hundred of thousands people are diagnosed with diabetes mellitus (Hart Bulletin, 2005). Diabetes mellitus is a major cause of blindness, kidney failure, amputations, and cardiovascular disease, and its complications result in major reductions in both length and quality of life. In addition, the burden on individuals and on society extends past human suffering to include staggering economic costs, lost productivity, and social capital (Engelgau et al., 2003).

There are two main kinds of diabetes mellitus: type 1 and type 2 diabetes mellitus. Type 1 diabetes mellitus, also known as insulin dependent diabetes and which is a chronic disease, occurs mainly in childhood or early adolescence and requires daily insulin injections for survival (www.phac-aspc.gc.ca/publicat/dicdac2/english/55appendix_a_e.html).

Type 2 diabetes mellitus is also a chronic disease and characterised by insulin resistance and/or abnormal insulin secretion, either of which may predominate. People with type 2 diabetes mellitus are not dependent on exogenous insulin, but may require it for control of blood glucose levels if this is not achieved with diet alone or with oral hypoglycaemic agents (Zimmet et al., 2001). Most people are diagnosed with type 2 diabetes mellitus, which accounts for over 90% of cases globally. The increase in prevalence of type 2 diabetes mellitus patients is associated with the aging of the population, early diagnostics, the dramatic rise in the prevalence of obesity and a more sedentary lifestyle (Wing et al., 2001). Because of the enormous increase in prevalence of type 2 diabetes mellitus and its seriousness, it is important to develop effective health promotion programmes.

Efficacious treatments for diabetes mellitus patients are currently available but the quality of diabetes care being delivered is suboptimal in both developed and developing countries (Engelgau et al., 2003). In the Netherlands, different health care providers are treating and counselling diabetes mellitus patients. With respect to education for the type 2 diabetes mellitus patients, different methods and materials have shown to be effective, for example physical activity programmes.

Besides the methods and materials, which are effective, a lot of improvements can be made (Looise, Poel van der, Bos, 2006). To obtain optimal diabetes care, traditional symptom-directed treatments should be replaced by patient-centred, integrated and proactive health promotion programmes (Mathieu et al, 2006).

The ultimate goal of diabetes care is to maintain and, if possible, enhance patients' perceived quality of life. Indeed, the true challenge of diabetes care is to help patients balance short and long-term quality of life against the burden of daily intensive self-management (Visser & Snoek, 2004). Self-management involves the person with diabetes mellitus engaging in activities that protect and promote health, monitoring and managing of symptoms and signs of diabetes mellitus, managing the impacts of diabetes mellitus on functioning, emotions and interpersonal relationships and adhering to treatment regimes (Flinders, 2005).

1.2 Recent developments in diabetes care in the Netherlands

In the Netherlands, the Ministry of Health, Welfare and Sport (VWS) aims to improve the quality of diabetes care by improving the coordination between health care providers (e.g. general practitioners, medical nurses, specialist and dieticians) (Struijs, Westert, Baan, 2004; www.zonmw.nl/nl/organisatie/publicaties/mediator/archief/mediator-7-2004/ministerie-baant-de-weg-naar-goede-diabeteszorg). Because of task rearrangement, much more care will be accommodated at integrated care settings. Nowadays, the coordination between health care providers frequently takes place in accordance with care programmes, for example integrated diabetes care programmes. The purpose of such a care programme is to offer connected, integrated and flexible health care activities along with the patients' needs as a starting point. During the last years, many integrated diabetes care programmes were set up by health care providers themselves. Integrated diabetes care is expected to result in a better care control of patients with diabetes mellitus (Struijs et al., 2004; Siminerio et al., 2006). Often, the continuation of integrated diabetes care programmes is not guaranteed due to a lack of structural financing.

In for example the middle and south of Limburg, initiatives are taken to develop a Diagnostic Treatment Combination (DTC) with regard to diabetes mellitus in order to continue an integral and structural financing for integrated diabetes care. A DTC diabetes mellitus gives a description of complete care for diabetes patients in accordance with the standard for diabetes care and the Dutch Diabetes Federation guidelines

(<http://www.diabetesfederatie.nl/Adobe/Zorgstandaard.pdf>;

http://nhg.artsennet.nl/uri/?uri=AMGATE_6059_104_TICH_R1690081092740334).

In addition, it aims to promote health by realising an integral financing. Furthermore, it wants to deliver patient oriented and multidisciplinary diabetes care

(www.zonmw.nl/nl/home/nieuws/januari-2007/zorggroepen-diabetes-van-start-met-keten-dbc.html).

1.3 Description of the research setting, research topic and relevance

1.3.1 Research setting and research topic

The Institution Beyaert Robuust Limburg gives assistance to extramural care settings in the Middle and South of Limburg with regard to quality of care, cooperation and continuation. This institution, which is located in Maastricht, is carrying out a project (healthy life inside Limburg) with respect to the development and implementation of an effective health promotion programme for type 2 diabetes mellitus patients. Eventually, the projects' aim is to reduce the burden on type 2 diabetes mellitus patients and society.

Part of this project is the development of an instrument to measure needs, preferences and characteristics of type 2 diabetes mellitus patients regarding health promotion. Since these need to be taken as a starting point to improve the quality of care. In order to develop this instrument, it is necessary to identify important determinants at first. This is the topic of this thesis. Subsequently, the identified determinants are included into the instrument.

Although the focus of this study is on type 2 diabetes mellitus patients, some findings might also be relevant for type 1 diabetes mellitus patients. This will be indicated where relevant.

During research, a select group of type 2 diabetes mellitus patients are asked for their needs and preferences.

A need indicates a difference between what currently exists and a more desirable state (Bartholomew, Parcel, Kok, Gottlieb, 2001). Patients' preferences refer to the individual evaluation of dimensions of health outcomes. These judgements are expressed as statements or actions. Patients' preferences result from cognition, experience and reflection and exist as

the relatively enduring consequences of values (Brennan, 1998). Eventually, needs and preferences are investigated among type 2 diabetes mellitus patients with different characteristics. This is done in order to be able to deliver tailored health promotion activities. A characteristic, for example gender and age, includes being a feature that helps to distinguish a person or thing. (American Heritage Dictionary of the English Language, 2000). For instance, patients with an age above sixty might have other preferences than patients with an age below sixty.

The choice for conducting interviews among type 2 diabetes mellitus patients is related to the projects emphasis, which encloses type 2 diabetes mellitus patients and extramural care setting. Mostly, extramural care settings are treating type 2 diabetes mellitus patients. Another reason for conducting the interviews only among type 2 diabetes mellitus patients has to do with the origin and treatment of this diabetes type. Obesity and a more sedentary lifestyle are two important factors which influence type 2 diabetes mellitus. It is important to deal with these items in order to decrease diabetes patients' human and economic burden (Wagner et al., 2005).

1.3.2 Relevance of research topic

For a health care provider it is very important to measure needs and preferences of type 2 diabetes mellitus patients regarding health promotion. Nowadays, diabetes mellitus patients are more independent than before and they want to take more often than before the responsibility for their own disease. Knowledge of patients' needs and preferences is obtained in order to be able to deliver integrated diabetes care. While matching patients' needs and preferences regarding health promotion activities to similar health promotion programmes, diabetes patients are expected to be motivated to perform health promotion activities and eventually a decline in human and economic burden will arise (Wagner et al., 2005).

Moreover, it is not completely understood yet which needs and preferences regarding health promotion a person with diabetes mellitus demands. By designing an instrument which encloses the development of a systematic and valid way of measuring, a more efficient and effective way of health promotion might be obtained. Ultimately, based on the instrument, health promotion programmes, which are more appropriate to the patients' needs, preferences and characteristics, can be developed.

1.4 Aim of the study, central research question and sub-questions

The aim of the research project is to identify determinants which will be included into an instrument to measure needs, preferences and characteristics of type 2 diabetes mellitus patients regarding health promotion.

The central research question to be addressed in the thesis research project is:

“Which determinants can be identified, which will be included into an instrument to measure needs, preferences and characteristics of type 2 diabetes mellitus patients regarding health promotion”?

The central research question is divided into sub-questions, also known as research questions. The research questions are noted below. Research question one is described in chapter two and research question two and three are described in chapter four.

1. What is known from the scientific literature about the PRECEDE- PROCEDE Model to measure needs, preferences and characteristics of diabetes mellitus patients regarding health promotion?
2. What is known from the scientific literature about effective health promotion interventions and strategies concerning diabetes mellitus patients (‘state-of-the-’art regarding effective health promotion interventions)?
3. What are the opinions of a select group type 2 diabetes mellitus patients’ concerning their needs and preferences regarding health education and promotion in the south and middle of Limburg and what are these patients’ characteristics?

2. Theoretical framework

This chapter gives a description of two theoretical frameworks in which the study is carried out. These theoretical frameworks are the PRECEDE- PROCEED Model, derived from Green and Kreuter (1999) and the Chronic Care Model, which is derived from Wagner (1998). The PRECEDE-PROCEED Model is chosen because it describes the process of health programme planning, including a needs assessment. During performance of a health promotion programme, communication style is an important component and therefore this subject is discussed during this chapter. Subsequently, the Chronic Care Model is chosen as additional model, because it provides a framework for an organisational approach and is shown to improve processes and outcomes.

2.1 PRECEDE-PROCEED Model

The main theoretical framework consists of the PRECEDE Model for health programme planning (Green & Kreuter, 2005). This framework is part of the PRECEDE- PROCEED Model for health programme planning.

The primary purpose of implementing a population health programme follows a straightforward and unambiguous formula: enhance quality of life and health status by doing what is necessary to prevent or short-circuit illness and injury. Population health programmes regarding diabetes mellitus may operate at one stage or a combination of three stages of prevention. Primary prevention activities are very important to prevent type 2 diabetes mellitus and these activities contain promoting a healthy diet, increasing physical activity, avoiding obesity and stimulating smoking cessation. Secondary prevention programmes mainly focus on early detection activities, for example screening activities to detect type 2 diabetes mellitus. In the Netherlands, no such systematic screenings occurs on diabetes mellitus (www.rivm.nl/vtv/object_document/o4094n26650.html). Tertiary prevention refers to rehabilitation and therapy adherence (www.rivm.nl/vtv/object_class/kom_prevdiabetes.html). During the project, the main emphasis is at tertiary prevention, which has been translated into health promotion.

The PRECEDE framework was developed in the 1970s by Green and colleagues (Green, Kreuter, Deeds, and Partridge, 1980). The acronym stands for Predisposing, Reinforcing, and Enabling Constructs in Educational/ Environmental Diagnosis and Evaluation. PRECEDE is based on the premise that just as medical diagnosis precedes a treatment plan, so should educational diagnosis precede an intervention plan. This approach addressed a concern among

some professionals that health education focused too much on implementing interventions and too little on designing interventions that were strategically planned to meet demonstrated needs (Bartholomew et al., 2001). In 1991, PROCEED (Policy, Regulatory, and Organisational Constructs in Educational and Environmental Development) was added to the framework to recognise the importance of environmental factors, such as determinants of health and health behaviours. Figure 1 gives an overview regarding the PRECEDE-PROCEED planning Model from Green and Kreuter, 1999.

The PRECEDE-PROCEED process rests on a fundamental principle of practice, the principle of participation, which states that success in achieving change is enhanced by the active participation of the intended audience in defining their own high- priority problems and goals and in developing and implementing solutions (Green & Kreuter, 1999). This corresponds to the interactive approach in diabetes self-management (Whittemore, 2000). The approach has changed from passive learning on the part of the person with diabetes mellitus to active participation in self-care and decision making.

Accordingly, at each step in the PRECEDE-PROCEED assessment, efforts should be made to include input from the programme's intended audience. PRECEDE-PROCEED is a nine step planning process that begins at the end, focusing on the health related outcomes of interest and working backward to diagnose which combination of intervention strategies will best achieve the objectives (Glanz, Rimer, Lewis, 2002).

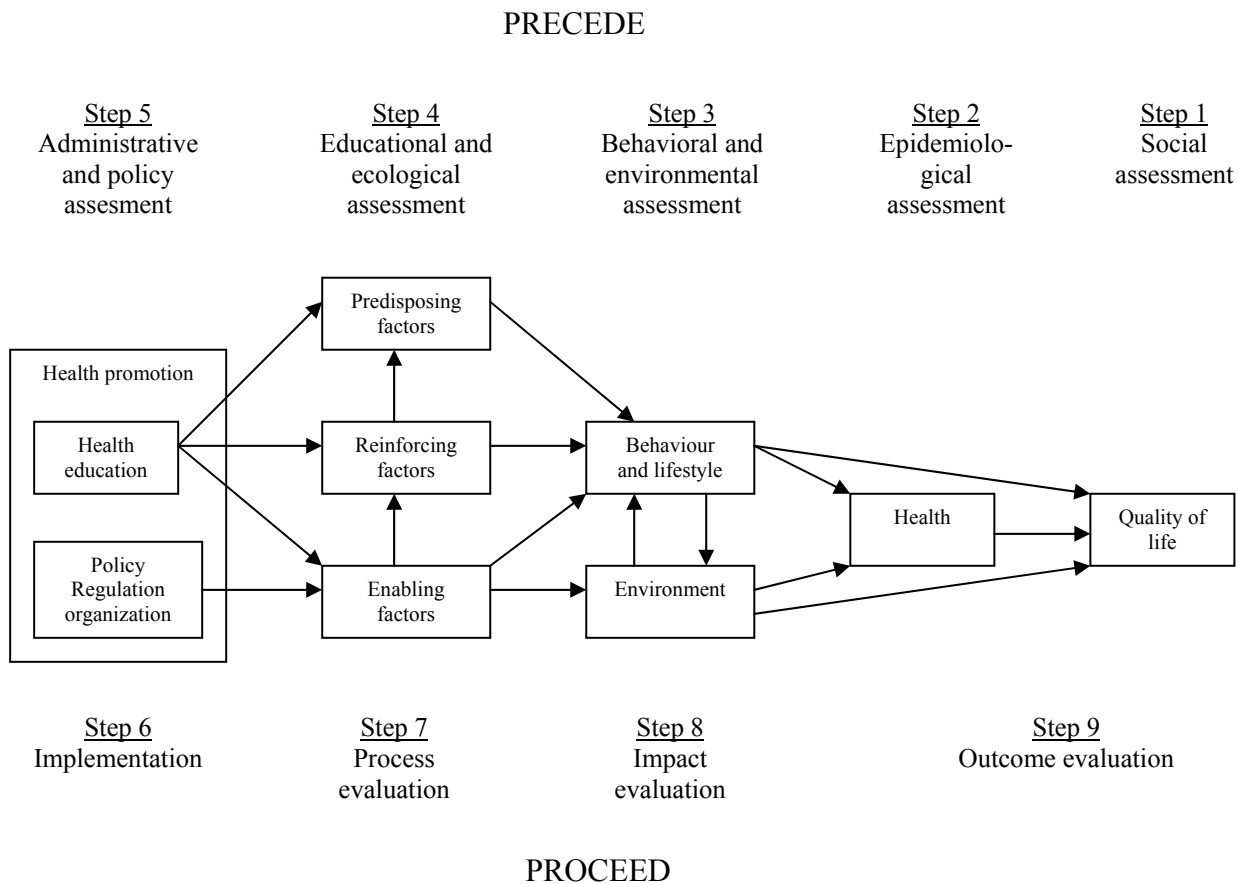


Figure 1: the precede-proceed planning model
from Green and Kreuter, 1999

As mentioned above, the PRECEDE framework is used as one of the theoretical frameworks. The PRECEDE process encloses a needs assessment. A needs assessment is a systematic study of quality of life and health status and those factors that influence them, such as health behaviour and environment. It is a systematic study of the discrepancy between what is and what should be in a group and situation of interest (Bartholomew, Parcel, Kok, Gottlieb 2006). Figure 2 gives an overview regarding a logic model for needs assessment which is derived from Green and Kreuter, 2005.

An effective programme must address a real need or problem. It is therefore very important to include the stakeholders' needs. Stakeholders are those people who participate in or receive programme services (Green & Kreuter, 2005).

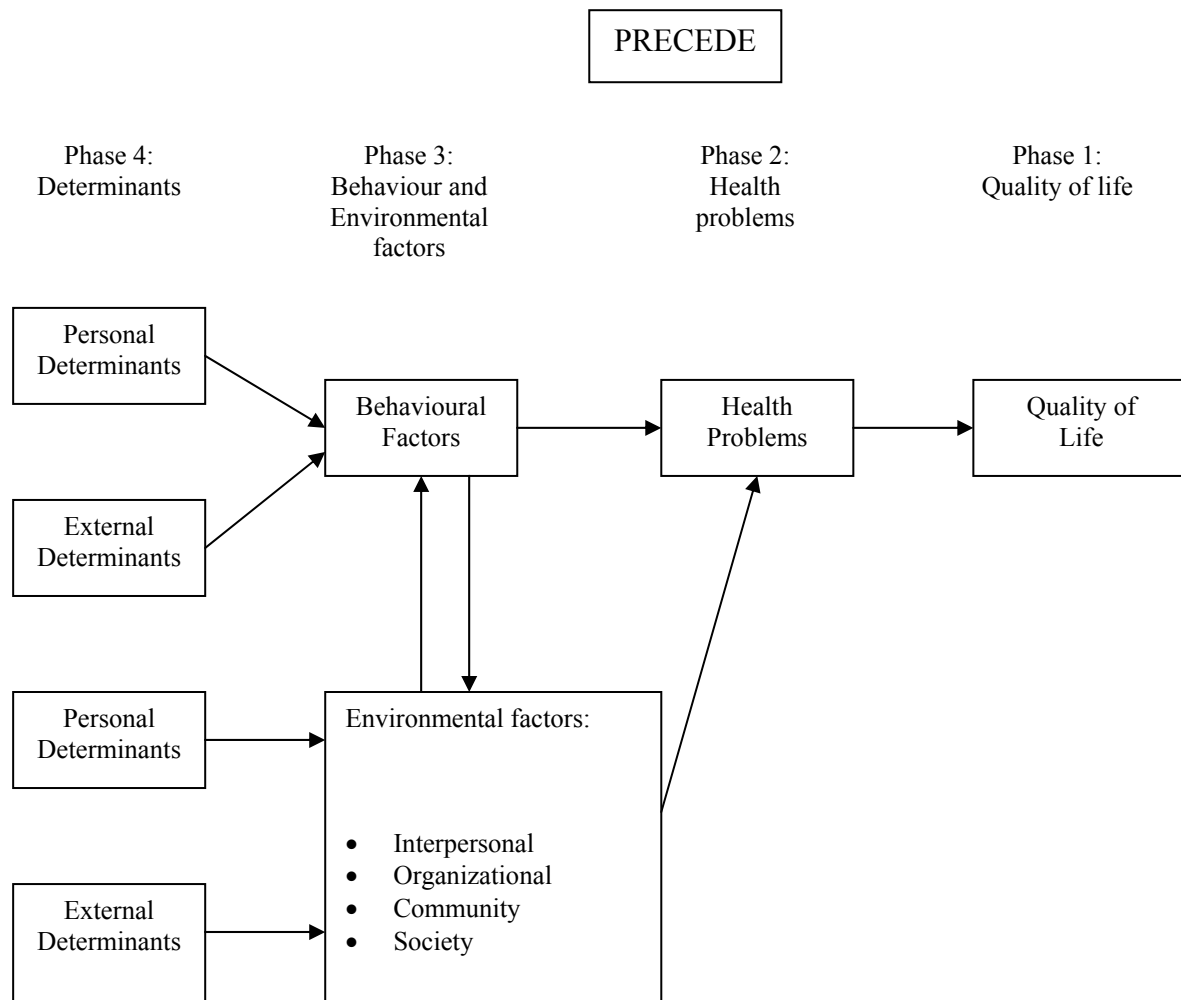


Figure 2: logic model for needs assessment, derived from Green and Kreuter, 2005

When conducting a needs assessment with regard to health promotion programmes for diabetes mellitus patients, the social assessment determines patients' needs and preferences. The behavioural and environmental assessment gives a description of patients' characteristics.

The social assessment phase applies the principle of participation to ensure the active involvement of the patients intended to benefit from the proposed programme. The social assessment wants to discover "common ground" (see Figure 3: area a). It is important to bring together the three key perceptions or assessments that influence planning: the patients' perceived needs regarding health promotion, the health professionals' perceived "actual"

needs as indicated by scientific data and the policy makers' perception of resources, feasibilities, and policy regarding health promotion. The health professionals' perceived "actual" needs can be translated into effective health promotion programmes. It is in area a (Figure 3) where action is most likely, because it is here that policy makers and others who allocate resources see the greatest convergence of patients' sentiment and scientific data. The task of social assignment and the subsequent steps in health programme planning is to bring the three spheres of perception into closer alignments (Green & Kreuter, 2005).

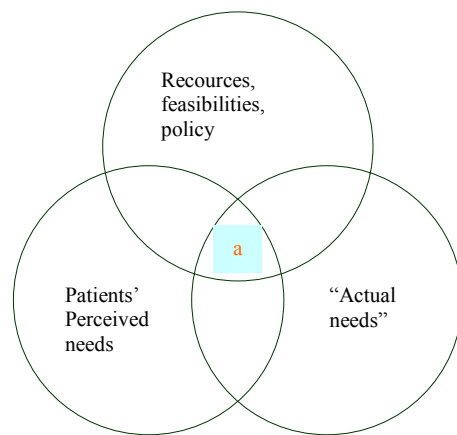


Figure 3: Finding the common ground among the patients' perception of needs, the health sector's measurement of needs, and policy makers' perceptions, resources and feasibility of meeting needs.

In the thesis research project, the central focus is at the patients' needs and the health professionals' perceived "actual" needs. The policy makers' perception of resources, feasibilities, and policy regarding health promotion are not be taken into account, due to limited time for conducting this research.

2.2 Communication style

After construction of an effective health promotion programme, the health promotion programme will be performed. During an interaction process between patient and caregiver different discussion techniques can be used. For health care givers it is important to coach and listen to patients and to realise a dialogue with the patient. A well-known discussion technique is motivational interviewing, which is a client-centred and directive method for facilitating change. It wants to realise a dialogue between health care giver and patient. During motivational interviewing, the role of patients is to be well- informed active partners

or collaborators in their own care. Patients need to understand their role as a decision maker and how to assume responsibility for their care (Funnel and Anderson, 2004).

2.3 Chronic Care Model

Besides the PRECEDE- PROCEED Model, the Chronic Care Model is chosen as additional model, because it provides a framework for an organisational approach and is shown to improve processes and outcomes.

Figure 4 gives an overview regarding the Chronic Care Model which is derived from Wagner, 1998. The Chronic Care Model is based on the premise that effective health promotion programmes are delivered in partnership with health systems and communities (Siminerio et al., 2006).



Figure 4: Chronic Care Model, derived from Wagner, 1998

The Chronic Care Model identifies six key elements that are critical to success. These elements are: health system, community, decision support, self-management-support, clinical information systems and delivery system design (Glasgow, Orleans, Wagner, 2001).

First, the health system has to serve as the foundation by providing structure and goals.

Second, the community should be linked with community resources (Siminerio et al., 2006).

For prevention especially, because of the central role played by social-environmental factors influencing lifestyle, many of the interventions are most appropriately and effectively implemented through linkages with community resources, policies and organisations

(Glasgow et al., 2001). Third, decision support has to ensure that providers have access to evidence-based guidelines. Fourth, self-management support helps patients acquire skills and confidence for self-management. Fifth, clinical information systems have to provide timely access to data about patients and patient populations. Sixth and finally, delivery system design has to restructure medical practices to facilitate team care (Siminerio et al., 2006).

Evidence-based change concepts under each element, in combination, foster productive interactions between informed patients who take an active part in their care and providers with resources and expertise.

The Chronic Care Model can be applied to a variety of chronic diseases including diabetes mellitus, health care settings and target populations. The bottom-line is healthier patients, more satisfied providers, and cost savings (Glasgow et al., 2001).

Regarding the research, the PRECEDE-PROCEED Model is directional for data collection. The model gives the opportunity to identify important determinants which will be included into an instrument to measure needs and preferences of type 2 diabetes mellitus patients regarding health promotion.

The Chronic Care Model facilitates an effective implementation of health promotion programmes. This step goes beyond the research, but it is important to mention this model because of its comprising view.

3. Research methods

This chapter describes the planning and performance of the research.

First, the research approach and research design is described. Next, data collection and recording procedure, data analysis procedure and trustworthiness are described. During reportage of research methods, a distinction is made between scientific literature and interviews.

3.1 Research approach and research design

The research project has a qualitative approach. The research is takes place in a natural setting and during execution of interviews, the research is conducted at the patient's home.

Participation of diabetes patients is required to gather information regarding needs, preferences and characteristics of the target group and to verify findings from scientific literature. During the analysis, an interpretation of the data is made. This is another characteristic of a qualitative approach (Creswell, 2003).

The research design is a phenomenological design. The procedure of a phenomenological research design involves studying a small number of patients (Creswell, 2003). Philosophical tradition assumes that one can only study and understand the real nature or essence of phenomena by studying them in their true, natural context. The research project is best suited by phenomenological research because it is a study design to uncover both true essence of things and lived experience (Creswell, 2003).

3.2 Data collection and recording procedure

Information is collected through an extensive literature search and through interviews among adult type 2 diabetes mellitus patients.

3.2.1 Scientific literature

After formulating the problem statement and research questions, a thorough literature search is taken place regarding effective health promotion interventions and strategies concerning diabetes mellitus patients.

Before searching literature by databases, inclusion and exclusion criteria are used for the selection of articles. Table 1 gives an overview regarding the inclusion and exclusion criteria. During literature search, articles regarding children are excluded to the study. This is done to restrict research findings. This target group also demands another approach. Mostly, children are diagnosed with type 1 diabetes mellitus. This specification is also influential for excluding

children to the study, because the research's emphasis is at patients diagnosed with type 2 diabetes mellitus. During literature search, information is collected regarding diabetes mellitus patients in general. Articles regarding type 1 diabetes mellitus as well as type 2 diabetes mellitus are included into the search, because a lot of articles do mention diabetes mellitus and do not specify diabetes type.

To answer research question two and to search by way of inclusion and exclusion criteria, the databases Cochrane library, Pubmed, CINAHL and Google are used to search for relevant articles. Table 2 gives an overview of the key words which are used to search for relevant articles.

Table 1: inclusion and exclusion criteria

| Inclusion criteria | Exclusion criteria |
|--|--|
| 1) Type 2 diabetes mellitus patients | 1) Children and young adults with diabetes mellitus (\leq 18 years); |
| 2) Adult patients (\geq 18 years); | 2) Patients without diabetes mellitus or pre-diabetes; |
| 3) Health promotion regarding diabetes mellitus, divided in: - Interventions regarding groups, education, food, physical activity, smoking cessation and self-management; - Interventions regarding diabetes mellitus patients which enclose patient characteristics. The following patient characteristics are important: diabetes type, age, gender, Social Economic Status, educational level, extent and seriousness regarding diabetes complications, therapy, place of residence, region and cultural background; - Investigations which give a description regarding effective health promotion activities among diabetes mellitus patients; - Investigations which describe effective health promotion activities among diabetes mellitus patients, resulting in positive well-being, quality of life and laboratory values (HbA1c). | 3) Incidence and prevalence studies regarding diabetes mellitus; |
| | 4) Articles which enclose other subjects than health promotion among diabetes mellitus patients; |

Table 2: key words

| | | |
|--|---------------------------------------|------------------------------------|
| Diabetes mellitus, type 1 | Diabetes mellitus, type 2 | Diabetes mellitus |
| Prevention | Tertiary prevention | Health promotion |
| Interventions regarding health promotion | Strategies regarding health promotion | Self-management |
| Smoking cessation | Education | Interventions directed at internet |
| Physical activity | Nutrition | Companion contact |

By way of database Cochrane library, Pubmed and Google, a search is taken place by means of two combination words. Through database CINAHL, a search is taken place by means of three combination words. These combination words also enclose patient characteristics. Table 3 gives an overview of combination words which are used to search relevant literature.

Table 3: overview of combination words which are used to search relevant literature

| Two combination words | Three combination words |
|---|--|
| Diabetes and education | Diabetes/ type/ health promotion |
| Diabetes and physical activity (programs) | Diabetes/ SES/ health promotion |
| Diabetes and nutrition | Diabetes/ culture/ health promotion |
| Diabetes en smoking cessation | Diabetes/ region/ health promotion |
| Diabetes and internet | Diabetes/ age/ health promotion |
| Diabetes and companions | Diabetes/ educational level/ health promotion |
| Diabetes and effective interventions | Diabetes/ seriousness of complications/ health promotion |
| | Diabetes/ gender/ health promotion |
| | Diabetes/ therapy/ health promotion |
| | Diabetes/ place of residence/ health promotion |

After searching through relevant databases, professionals in diabetes care are consulted for additional references. After literature search, selected articles are categorised as education, physical activity, nutrition, smoking cessation and general information / patient characteristics. View the added CD-ROM for a summary of the literature search (Ruijschop, 2007).

3.2.2 Interviews

Face-to-face interviews are conducted among type 2 diabetes mellitus patients. The interviews are intended to verify scientific literature and to elicit views and opinions from diabetes mellitus patients concerning their needs and preferences regarding health promotion.

Employees of the Institution Beyaert Robuust Limburg have approached family doctors and employees in a doctor's practice, which are counseling diabetes mellitus patients, for participation into the project. After agreement for participation, these diabetes counsellors are approached to select patients with different characteristics to participate into the interviews. These care givers are approached, because they have a regular contact with the patients. They explained the interview's purpose and asked patients for their interest to participate into the interviews. After informed consent, the patients are contacted for an appointment for the interview. The patients are interviewed at home. The interview includes a topic list which encloses thirty seven questions. The questions are open-ended. Topics of conversation are determined from the problem statements' perspective, they arose from risk factors, and enclose questions related to patient characteristics and questions regarding health promotion interventions, which are specified in general questions, questions related to education, physical activity, smoking cessation and nutrition. Ten questions have an accent on patient characteristics. The other questions emphasise health promotion interventions. During all interviews, questions are asked according to an equal structure. See the Appendix for a description of the topic list. Before the interview, the purpose and procedure are explained. An evaluation question is asked as final question.

Seven type 2 diabetes mellitus patients are selected for the interviews, including one patient who is selected for piloting the interview questions. The selected patients exhibit different characteristics. The purpose for selecting patients with different characteristics is to compare needs and preferences among type 2 diabetes mellitus patients. It has no generalising function, but a descriptive function. The patient characteristics are severity of complications, therapy, educational level, gender, age, Social Economic Status (SES), place of residence (village or town), region and cultural background. Severity of complications is classified into diabetes complications or no complications. Therapy is classified into insulin (possibly mixed with tablets) or tablets. Educational level is classified into a low educational level or a moderate to high educational level. In addition, age is classified into an age above sixty or an age beneath sixty. Social Economic Status is classified into a low SES or a moderate to high SES. Social Economic Status encloses patients' living conditions and stressful factors. Finally, cultural background is classified into autochthonous or allochthonous patients. The selection of patient characteristics is partly based on scientific data. Patient characteristics, which seem relevant according to literature, are Social Economic Status,

educational level and cultural background. (Middelkoop, GeelhoedDuijvestijn, Wal., 2004; Schillinger, Barton, Karter, Wang, Adler, 2006; Voorham, Uitewaal, Bruijnzeels 2002). Other connections regarding patient characteristics related to health promotion are not found. Despite this limited information, other selection characteristics are included because of personal communication. According to the researcher, these patient characteristics can influence the choice for health programme planning.

Three regions in the middle and south of Limburg are selected for the project. These regions are “Heuvelland”, Eastern south of Limburg and Western mining district. Four patients, including the patient who is selected for piloting the interview questions, are living in Eastern south of Limburg, two patients are living in “Heuvelland” and one patient is living in Western mining district.

During each interview, audiovisual materials are used for data recording (Creswell, 2003). All of the interviews are treated anonymous, i.e. personal details are not noted and recorded information is erased. The interviews do not have any consequence for the patients, i.e. there is not an invasive examination.

3.3 Data analysis procedure

After organizing the collected information regarding literature search and interviews, data analysis is the next step.

3.3.1 Scientific literature

During data analysis, articles are assessed on relevance which encloses in sequence of importance kind of study, the utilization of Dutch studies and the year of publication. First, when identifying the kind of study, articles which are classified as a systematic or descriptive review or a meta- analysis are of most value, because they contain many executed studies. These articles are used for describing results and conclusions. Other studies, for example randomised controlled studies, are not used for describing outcomes. This is also done to mark out the description of results. An exception contains Dutch studies. These investigations are of much value, because they are performed in The Netherlands. The project “healthy life inside Limburg” is also performed in The Netherlands.

Second, the year of publication is of great importance. Articles which are published after 2000 are of more value than articles which are published before 2000, because they are more actually.

3.3.2 Interviews

After data collection and recording, a text file is used for description of recorded information. Recorded information is transcribed partly. Catchwords are used to note down reported information and to analyse important needs and preferences of type 2 diabetes mellitus patients regarding health promotion. During data analysis, no qualitative data programme is used. Interview questions are steered and directive and are the result of an extensive literature search.

Data is analysed by first reading through all the data to obtain a general sense. Subsequently, a coding process is used to generate an overall description regarding the interview questions.

3.4 Trustworthiness

An investigation has to meet specific demands to become trustworthy. Confirmability, credibility, transferability, dependability and reliability are factors which determine the trustworthiness of qualitative research. Qualitative research tends to assume that each researcher brings an unique perspective to the study.

Confirmability refers to the degree to which the results could be confirmed or corroborated by others (Maso & Smaling, 2004). During the investigation, confirmability is guaranteed. The research process is followed critically by two professional counsellors, who are working at University Maastricht. For example, they asked questions about description of results and methods of investigation.

The credibility criterion involves establishing that the results of qualitative research are credible or believable from the perspective of the participant in the research (Maso & Smaling, 2004). The investigations' credibility is increased. During investigation, notes are reported. During each interview, audiovisual materials are used for data recording. This is done to avoid distortion and interpretation errors. The topic list is followed strict to convince that important items are measured. During interview, information is summarised regularly. Through summarisation it is possible to check whether data collection is correct. Subsequent, progress conversations took place along with supervisors who are working at University Maastricht. During these conversations progress was discussed.

Transferability refers to the degree to which the results of qualitative research can be generalised or transferred to other contexts or settings (Maso & Smaling, 2004).

Transferability of study results is not possible. The conducted interviews do not have a generalising function, but a descriptive function. The investigation is taken place in a small population. Much more research is needed before study results can be transferred.

The traditional quantitative view of reliability is based on the assumption of replicability or repeatability. Essentially it is concerned with whether we would obtain the same results if we could observe the same thing twice (Maso & Smaling, 2004). The reliability is increased because the interviews are performed through the same investigator. So, a high degree of consistency is realised.

With respect to content, the interviews are reliable because of a consistent topic list. During all interview, the same topic list is used. Further, the reliability is increased because of selecting a patient for exercising the interview questions. The test interview contains the same topic list. After performing the test interview, the topic list is not re-adjusted. Already, all relevant subjects were included. Before performing the interviews, the topic list is assessed through two counsellors who provided relevant feedback. Additionally, the reliability is raised because the topic relevance is tested through an extensive literature search. The patients are interviewed at home. This situation is more comfortable for a patient which increases reliability.

The idea of dependability, on the other hand, emphasises the need for the researcher to account for the ever-changing context within which research occurs. The research is responsible for describing the changes that occur in the setting and how these changes affected the way the research approached the study (Maso and Smaling, 2004).

It is difficult to determine the investigations dependability because of a changing external situation.

4. Results

Section one of this chapter describes the results of the literature study. In section two the results of the interviews are outlined.

4.1 Scientific literature

The literature search generated hundred and thirty articles. Most articles are found in the databases Cochrane library, Pubmed and CINAHL. For example, all smoking cessation articles are selected by database Cochrane library and most education articles are selected by database Pubmed. After screening the selected articles on relevance, hundred and fourteen articles are included as reference and are summarised on the CD-ROM (Ruijschop, 2007), using the headings article, intervention, results/ conclusions, patient characteristics, method of investigation and kind of study. The other articles are not summarised because of unsatisfactory relevance.

After analysing the summarised articles, forty-nine articles are classified as a review and four articles are classified as a meta-analysis. Regarding these articles, forty-two articles are used for describing results of this study. The selection for describing results is based on well-known authors, for example Looise (2005, 2006) and Norris (2001, 2002, 2007), and articles which already include summarised information. Except four articles, the reviews and meta-analysis are published after 2000. The other articles, which have an amount of sixty-one, are mostly classified as a randomized controlled trial. Most of these articles, except three, are not used for describing results. The three articles, which are also used for describing results, are classified as a randomised controlled trial, an experiment and a cross-sectional design and enclose information regarding patient characteristics. The three articles are published after 2000 and two of these articles are conducted in The Netherlands.

The study results are classified into health promotion interventions regarding education, physical activity, nutrition and smoking cessation. Further, a classification is made regarding general information and patient characteristics. Education also encloses group-based education and internet-based education. Results regarding self-management interventions are not described apart. These results are noted down among educational results, because these interventions mostly are educational in nature. Most common study outcomes enclose data regarding HbA1c-levels, knowledge and skills, self-care ability and quality of life (Norris, Engelgau, Venkat Narayan, 2001; Engelgau et al., 2003; Hampson et al., 2001). HbA1c, which is also known as glycated haemoglobin, reflects the average blood glucose level over the past three months (American Heritage Dictionary of the English Language, 2000). After

describing the results, Table 4 gives an overview regarding connections between health promotion interventions and outcome variables.

4.1.1 Education

From literature search appeared that a lot of research is conducted regarding educational-based interventions. For describing the results, twenty reviews and three meta-analyses are used. The results are noted below and are divided in totally effectiveness of diabetes education and effective elements of diabetes education (Looise et al., 2005).

❖ Totally effectiveness of diabetes education

In general, diabetes self-management education has a small positive effect on various outcomes including glycaemic control and knowledge (Norris et al., 2001; Norris et al., 2002). Educational and behavioural interventions, cognitive behavioural therapy and interventions related to interaction processes between extramural caregivers show a small effect on glycaemic control (Gary, Genkinger, Guallar, Peyrot, Brancati, 2003; Van Dam, Van der Horst, van den Borne, Ryckman, Crebolder, 2002; Snoek and Skinner, 2002; Ellis et al., 2004). After performing diabetes self-management education, HbA_{1c}-levels decreased varying from 0,43% to 2,4% (Hampson et al., 2001; Visser and Snoek, 2004; Mensing and Norris, 2003; Gary, Genkinger, Guallar, Peyrot, Brancati, 2003; Norris et al., 2002).

Self-management programmes, especially with more components, for example educational and behavioural interventions, have a positive effect on obedience and Haemoglobin A_{1c}-levels (HbA_{1c}) (Sarol, Nicodemus, Tan, Grava, 2005). A self-management programme has also a positive influence on quality of life, although there is little literature measuring quality of life and long-term clinical outcomes. Especially, effects of a self-management programme are visible at the short term (< six months) and are demonstrated on knowledge, frequency and precision regarding self-monitoring of blood sugar level, self reporting food behaviour and glycaemic control (Norris et al., 2001). Effects are decreasing as time elapses (Norris et al., 2002; Cooper, Booth, Fear, Gill, 2001). Furthermore structural education, provided through group sessions, contributes to effectiveness on HbA_{1c}- levels (Looise et al., 2006).

❖ Effective elements of diabetes education

- Setting/ transfer way

Interventions which include face-to-face contact, cognitive reframing and physical activity have a great possibility to influence HbA_{1c}-levels positively (Looise et al., 2006; Clement,

1995; Ellis et al., 2004). Educational strategies which are combined (for example an intervention programme, which gives individual one to one instruction and also gives lessons in groups) attain larger knowledge gains compared to separated interventions (Looise et al., 2006). Psychosocial interventions, which are offered in a group, are a promising addition to diabetes care and education (Looise et al., 2006). Karlsen, Idsoe, Dirdal, Hanestad, Bru, 2004 conclude that the group-based counselling programme is feasible in the sense of suggesting that cognitive restructuring and problem-solving approaches in groups may be useful in helping people adjust to diabetes. A group-based counselling programme can decrease HbA1c-levels by 0,4% at 24 months (Visser en Snoek, 2004). Self-management training for adults with type 2 diabetes mellitus is proven to be effective within public places and community centres. Self-management training for adults with type 1 diabetes mellitus is proven to be effective at home (Norris et al., 2002).

Internet is an extremely useful medium in patient education for chronic disease care and effective health promotion. Considerable variability in quality of diabetes patient education web sites was found. Inclusion of evidence-based medicine concepts, role of family support, enhancement in customised content and easier feedback mechanism in the web sites can be a significant development in the direction of patient-centred diabetes care (Thakurdesai, Kole, Pareek, 2004). It is important to report that computerised self-instruction reinforces the health counsellors' role, but cannot replace this role (Clement, 1995, Norris et al., 2001). There is an enormous difference between patient education programmes between countries, even within Europe, largely due to differences in the health care systems (Snoek and Visser, 2003).

- Method/ content

Education sessions need to involve fewer lectures and more practical, interactive exercises that focus on developing specific skills (Krichbaum, Aarestad, Buethe, 2003). More recent literature has documented that education combined with behavioural therapies produced the greatest benefits (Brown, 1999), which is expressed in a decline in HbA1c-levels of 0,43% (Gary et al., 2003).

With regard to diabetes education, the next parts provide an effective contribution to diabetes care of type 2 diabetes mellitus patients:

- Patient participation; Patient participation seems to increase interventions' effectiveness.
- Empowerment; Empowerment-based diabetes group education emphasises strategies that are patient-centred, problem based, culturally relevant, integrative, and evidence-based.
- Learning methods for adults;

- Counselling during active learning (Looise et al., 2006).

Self-management education is proven to be effective when behavioural change strategies are used extensively. Increasing knowledge is necessary, but not sufficient to promote behaviour. (Clement, 1995). Interventions, at which a social worker takes the perspective of the patient, are less working than interventions in which the social worker tries to activate the patient (Michie, Miles, Weinman, 2003). Regarding adolescents, interventions which are based on theoretical models appear to be more effective than interventions which are not based on theoretical models (Hampson et al., 2000).

During education, depression becomes positive influenced through psychological interventions and quality of life is improved through self-management interventions (Steed, Cooke, Newman, 2003). Multidisciplinary, interactive group meetings for diabetes mellitus patients are shown to be effective. In these meetings, a lot of attention is devoted to topics which are very important during diabetes care. These topics are e.g. effective education regarding hygiene (especially regarding foets), healthy food, physical activity, smoking cessation and alcohol consumption. The group interaction works stimulating. Meetings are experienced as more pleasant. Participants acquire more insights into sound food and weight loss (Van Nunen, 2006).

- Provider/ performer

Self-management education is proven to be most effective when medication is adjusted by an expert and when learned behaviour is reinforced by the practitioner (Clement, 1995). The programme's effectiveness will increase when the provider is trained in offering diabetes education programmes (Deakin, McShane, Cade, Williams, 2005).

- Intensity

Follow-up contact is a valuable method for helping people to make a healthy adjustment to living with diabetes (Krichbaum et al., 2003). A programme which does not anticipate to a regular education follow-up has probably no effect in the long term (Norris et al., 2002; Clement 1995). Keeping educational groups small, e.g. ten participants or less in a group, is shown to result in better compliance (brown, 1999).

- Tailored intervention

Education and counselling activities need to be tailored to specific patient groups like adolescents, young adults and ethnic minorities with a low Social Economic Status (SES) position. (Visser and Snoek, 2004). Self-care interventions are considered effective when the intervention is concentrated on culture and/ or age, when group counselling or group support

is used and when adults and spouses are involved to the intervention (Sarkisian, Brown, Norris, Wintz, Mangione, 2003).

- Cost effectiveness

Self-management education regarding diabetes mellitus is related to a reduction in hospital admissions and is associated to a decrease in health care costs (Clement, 1995). Education, provided through group sessions is proven to be cost effective (Van der Ven, 2003).

Computer assisted instruction is rated as the least cost effective method of the methods surveyed (Gillispie & Ellis, 1993). In general, interventions which improve glycaemic control are cost effective (Klonoff and Schwartz, 2000).

4.1.2 Physical activity

For describing the results, three reviews are used. The results are noted below and are divided in different approaches which include an informational, behavioural, social, environmental and policy approach to assess the effectiveness regarding physical activity-based interventions. After performing physical activity-based interventions, HbA1c-levels decreased varying from 0,6% to 3,0% (Norris et al., 2002; Looise et al., 2006).

❖ Community- Wide Campaigns

Community- wide campaigns involve many community sectors in highly visible, broad-based, multiple intervention approaches to increasing physical activity. Campaign messages are directed to large and relatively undifferentiated audiences through diverse media, including television, radio, newspaper columns and inserts, direct mailings, billboards, advertisements in transit outlets, and trailers in movie theatres.

Strong evidence exists that community-wide campaigns are effective in increasing levels of physical activity, as measured by an increase in the percentage of people engaging in physical activity, energy expenditure, or other measure of physical activity (Kahn et al., 2002).

Effective community-based interventions which slow down the development of complications among diabetes mellitus patients are:

- Physical activity events, cooking demonstrations, supermarket and restaurant tours, media campaign and environmental support;
- Implemented strategies related to dietary change, weight control, and physical activity (e.g. walking groups).

Most reported improvements are an increase in knowledge regarding physical activity and adoption of regular physical activity (Satterfield et al., 2003).

❖ Mass Media Campaigns

Mass media campaigns are interventions that address messages about physical activity to large and relatively undifferentiated audiences. Messages are transmitted by using channels such as newspapers, radio, television, and billboards singly or in combination.

The campaigns are designed to increase knowledge, influence attitudes and beliefs, and change behaviour.

Available studies provide insufficient evidence to assess the effectiveness of mass media campaigns, when used alone, to increase physical activity or improve fitness. Media campaigns are, however, a component of other effective interventions and might provide additional benefits. Until more and better information becomes available, communities might choose to make decisions about the use of education-only programmes on grounds other than the evidence found in available studies (Kahn et al., 2002).

❖ Family-Based Social Support

Family-based interventions attempt to change health behaviour through the use of techniques that increase the support of family members for behaviour change.

According to Community Guide rules of evidence, available studies provide insufficient evidence to assess the effectiveness of family-based social support interventions in increasing levels of physical activity or improving fitness, because of inconsistent results among the studies (Kahn et al., 2002).

❖ Social Support Interventions in Community Settings

These interventions focus on changing physical activity behaviour through building, strengthening, and maintaining social networks that provide supportive relationships for behaviour change. This change can be achieved either by creating new social networks or working within pre-existing networks in a social setting outside the family, such as the workplace.

Interventions typically involved setting up a “buddy” system, making a “contract” with others to achieve specified levels of physical activity, or setting up walking or other groups to provide companionship and support while being physically active.

According to Community Guide rules of evidence, there is strong evidence that social support interventions in community settings are effective in increasing levels of physical activity, as measured by an increase in the percentage of people engaging in physical activity, energy expenditure, or other measure of physical activity (Kahn et al., 2002).

❖ Individually- Adapted Health Behaviour Change Programmes

Individually- adapted health behaviour change programmes are tailored to the individual's readiness for change, specific interests, and preferences. These programmes teach participants specific behavioural skills that enable them to incorporate moderate- intensity physical activity into daily routines. Physical activity can increase through the application of strategies which increase consciousness and knowledge.

According to Community Guide rules of evidence, there is strong evidence that individually- adapted health behaviour change programmes are effective in increasing levels of physical activity, as measured by an increase in the percentage of people engaging in physical activity, energy expenditure, or other measure of physical activity (Kahn et al., 2002) .

❖ Environmental and Policy Approaches to Increasing Physical Activity

Environmental and policy approaches are designed to provide environmental opportunities, support, and cues to help people develop healthier behaviours.

Correlational studies have shown that physical activity levels are associated with factors such as the availability of exercise equipment in the home and the proximity and density of places for physical activity within neighbourhoods (Kahn et al., 2002).

❖ Creation of or Enhanced Access to Places for Physical Activity Combined with Informational Outreach Activities

These interventions involve the efforts of worksites, coalitions, agencies, and communities to create or provide access to places and facilities where people can be physically active. For example, interventions in the body of evidence include providing access to weight and aerobic fitness equipment in fitness centres or community centres, creating walking trails, and providing access to nearby fitness centres.

According to Community Guide rules of evidence, there is strong evidence that creation of or enhanced access to places for physical activity combined with informational outreach activities is effective in increasing levels of physical activity, as measured by an increase in the percentage of people engaging in physical activity or other measures of physical activity (Kahn et al., 2002).

4.1.3 Nutrition

For describing the results, four reviews are used. Mostly, nutrition-based interventions are described in combination with physical activity-based interventions.

Previous research suggested that the combination of diet and physical activity is more effective for long-term weight loss maintenance and improved glycaemic control than either intervention alone (Wing et al. 2001). Weight loss strategies using dietary, physical activity, or behavioural interventions produced small between-group improvements in weight. These results were minimised by weight loss in the comparison group, however, an examination of individual study arms revealed that multi-component interventions including very low calorie diets or low calorie diets may hold promise for achieving weight loss in adults with type 2 diabetes mellitus (Norris et al., 2007). Combination strategies using dietary, physical activity and behavioural interventions can reduce HbA1c-levels by 1,6% (Brown, 1999).

Weight loss improves glycaemic control and reduces lipid and blood pressure co-morbid risks (Anderson, Kendall, Jenkins, 2003).

Concerning dietetics, motivational interviewing is an effective method. Motivational interviewing is a client-centred, directive method for facilitating change by helping people to explore and work through ambivalence. Motivational interviewing wants to change behaviour through intrinsic motivation (Looise et al., 2006).

4.1.4 Smoking cessation

For describing the results, eight reviews are used. The results are noted below and are divided in different smoking cessation support styles.

In the Netherlands, there are different effective smoking cessation support styles. The long-term success percentages vary from seven to twenty-four.

The methods described below were more effective than placebo. These methods are:

- Smoking cessation advice letters which are tailored individually.
- Individual counselling.
- Counselling by telephone.
- Group course.
- All forms of nicotine therapy.
- The medications bupropion en nortriptyline.

Acupuncture is not shown to be better than placebo. Concerning hypnotherapy, no univocal pronouncement can be done. Finally, with regard to the Allan Carr method, no randomised investigation is performed (Willemsen, Wagena, Van Schayck, 2003).

❖ Nursing interventions

Health care professionals, including nurses, frequently advise patients to improve their health by stopping smoking. Such advice may be brief or part of more intensive interventions.

The review of trials found that advice and support from nursing staff could increase people's success in quitting smoking, especially in a hospital setting (Rice and Stead, 2007).

❖ Individual behaviour counselling

Individual counselling is defined as a face-to-face encounter between a smoking patient and a counsellor trained in assisting smoking cessation. All the trials involved sessions of more than ten minutes, with most also including further telephone contact for support.

The review found that individual counselling could help smokers quit, but there was not enough evidence about whether more intensive counselling was better (Lancaster and Stead, 2007).

❖ Workplace interventions

Workplace interventions aimed at the workplace as a whole included tobacco bans, social support, environmental support, incentives (stimulus) and comprehensive (multi-component) programmes. The workplace can be an effective setting for people to stop smoking. Proven stop smoking methods, like group therapy, individual counselling and nicotine replacement therapy (NRT), are equally effective when offered in the workplace. (Moher & Lancaster, 2007)

❖ Community interventions

Since smoking behaviour is determined by social context, the best way to reduce the prevalence of smoking may be to use community-wide programmes which use multiple channels to provide reinforcement, support and norms for not smoking.

Although intervention communities often showed substantial awareness of their programme, this rarely led to higher quit rates. Similarly, increased knowledge of health risks, changes in attitudes to smoking, more quit attempts, and better environmental and social support for quitting were not accompanied by reductions in community smoking levels (Secker-Walker, Gnich, Platt, Lancaster, 2007).

❖ Telephone counselling

Telephone services can provide information and support for smokers. Counselling may be provided proactively or offered reactively to callers to smoking cessation helplines.

Telephone counselling is effective; multiple sessions are likely to be most helpful. Telephone quit lines provide an important route of access to support for smokers, and call-back counselling enhances their usefulness (Stead, Perera, Lancaster, 2007).

❖ Self-help interventions

Many smokers give up smoking on their own, but materials giving advice and information may help them and increase the number who quit successfully. Self-help interventions include for example computer-generated feedback, telephone hotlines, pharmacotherapy, booklets, pamphlets and leaflets.

Standard self-help materials may increase quit rates compared to no intervention, but the effect is likely to be small. It is not succeeded to find evidence that they have an additional benefit when used alongside other interventions such as advice from a healthcare professional, or nicotine replacement therapy. There is evidence that materials that are tailored for individual smokers are effective, and are more effective than untailored materials, although the absolute size of effect is still small (Lancaster and Stead, 2007).

❖ Exercise interventions

Taking regular exercise may help people give up smoking by moderating nicotine withdrawal and cravings. There is evidence from only one trial that an exercise programme (for example walk, jog, exercise counselling and group/ individual interventions) helps more smokers quit in the long-term than smoking cessation support alone (Ussher, 2007).

4.1.5 Patient characteristics/ general information

The results are noted below and are divided in patient characteristics and general information. For describing patient characteristics, a randomised controlled trial, an experiment and a cross-sectional design are used. Four reviews are added for describing general information because of its additional value.

❖ Patient characteristics

A higher Social Economic Status leads to improvements in HbA1c-levels. Regarding culture-specific diabetes care for Surinam South Asians with a low socio-economic position, an

average improvement in HbA1c-levels was found in the group with a higher socio-economic position. At most, HbA1c-levels can decrease 0,8%. Although the patients with the lowest socio-economic position did not sufficiently benefit from this intervention, an overall improvement was achieved in this poorly educated study population (Middelkoop et al., 2004). In a low-income population with diabetes, literacy mediated the relationship between education and glycaemic control. Individuals with a high school degree have statistically significant better glycaemic control than those with less education. Compared to less than a high school education, completion of high school and college education is associated with an absolute decrease in HbA1c-levels of 0,45% and 0,22% respectively (Schillinger et al., 2006). The use of foreign care consultants regarding education to Turkish diabetes mellitus patients can improve HbA1c-levels. The care consultants speak the same language as the Turkish patients (Voorham et al., 2002).

❖ General information

Given the strong association between lifestyle behaviours and the prevention and treatment of type 2 diabetes mellitus, greater research attention should be directed at issues related to the development of healthful eating and physical activity habits and strategies for modifying unhealthy behaviours (Wing et al. 2001). Also, more research is needed to increase knowledge regarding the effectiveness of group education for specific settings, populations, interventions, and educational goals. A determination should be made regarding the role of groups in promoting long-term behaviour changes. It is also important to collect information regarding cost-effectiveness (Mensing and Norris, 2003).

Further research should aim to translate psychosocial group interventions to other populations and settings, to develop new well- described interventions on a theoretically sound basis, and to evaluate such interventions through well-controlled, randomised study designs (Van der Ven, 2003). Eventually, it is important to conduct more research regarding the utilisation of computers for the benefit of education provision (Gillispie & Ellis, 1993).

Table 4: overview regarding the connection between health promotion interventions and outcome variables.

| | HbA1c-levels | Knowledge/ skills | Self-care ability | Quality of life |
|-------------------|--------------|-------------------|-------------------|-----------------|
| Education | + | + | ? * | ?* |
| Physical activity | + | + | ? * | ?* |
| Nutrition | + | + | ? * | ?* |
| Smoking cessation | ? | + | ? | ? |

+ : there is a positive connection.

- : there is a negative connection.

? : Connection is not found.

* Self-management programmes can enclose education, physical activity and nutrition-based aspects. There is evidence that self-management programmes have a positive effect on self-care ability and quality of life (Looise et al., 2006), The separated elements regarding a self-management programme, for instance education, physical activity and nutrition, do not find a connection to self-care ability and quality of life.

4.2 Interviews

This section gives, by means of the conducted interviews, an overview of patients' needs and preferences regarding health promotion. The interviews include a topic list which encloses thirty-seven questions. Largely, the interview topics and questions are based on the results of the literature search and are classified into results regarding patient characteristics and results regarding health promotion. In addition, results regarding health promotion are classified into health promotion activities, education, physical activity, smoking cessation, nutrition and general results. Seven type 2 diabetes mellitus patients are interviewed, including one patient who is selected for piloting the interview questions.

4.2.1 Patient characteristics

The patients which are selected for the interviews represent different characteristics. The selection of patient characteristics is partly dependent on scientific data. Patient characteristics, which seem relevant according to literature, are Social Economic Status, educational level and cultural background (Middelkoop et al., 2004; Schillinger et al., 2006; Voorham et al., 2002). Other selection of patient characteristics is based on personal communication. The patient characteristics are age, therapy, gender, educational level, place of residence (village or town), Social Economic Status, cultural background, severity of complications and region.

Four patients have an age which is beneath sixty and three patients have an age which is above sixty. Regarding gender, three females and four males are included. Four patients use insulin as therapy and three patients use tablets as therapy. Subsequently, five patients are moderate to high educated and two patients are low educated. Regarding residence, four patients are living in a village and the other patients are living in a town. All patients show a medium to high Social Economic Status. Related to cultural background, six patients are autochthonous and one patient is allochthonous and is born in Morocco. Further, five patients show to some extent diabetes complications and two patients do not exhibit diabetes complications. Finally, four patients, including the patient who is selected for piloting the interview questions, are living in Eastern south of Limburg. Two patients are living in “Heuvelland” and one patient is living in Western mining district.

4.2.2 Results regarding health promotion

The results regarding health promotion are classified into health promotion activities, education, physical activity, smoking cessation, nutrition and general results.

❖ Health promotion activities

In general, most patients report needs regarding nutrition-based activities and physical activity programmes. Four patients report needs regarding physical activity programmes and two of these patients also report needs regarding nutrition-based activities.

Most patients pay a visit to the employee in the doctor’s practice, who is counselling diabetes mellitus patients. One patient is visited at home because of physical restrictions. At the moment, most patients do not participate in health promotion programmes. Once a week, one patient participates in swimming activities. The next statement is reported by an old patient who shows a lot of physical restrictions: “We are living peaceful, which gives a lot of satisfaction”.

Inside family doctors practices, most patients report the absence of health promotion activities with exception of individual education by a counsellor. They also report to be ill- informed regarding health promotion activities. One patient, who is a woman, reports: “inside the family doctors practice, no health promotion activities are offered”.

Five patients report to be ill-informed regarding regional health promotion activities. The other two patients are informed regarding some regional health promotion activities. One patient, who is a woman, reports: “I know there is a specific offer of sports for people who have an age above fifty-five”.

Three patients report none or few needs and preferences regarding health promotion activities. The other four patients are missing health promotion activities regarding nutrition and physical activity.

❖ Education

Education is classified in general diabetes education, group-based education and internet based-education.

- Diabetes education

Three patients report no specific needs and preferences regarding diabetes education. Two of these patients report to have enough knowledge regarding the disease. One patient has no idea concerning needs and preferences. The other four patients report specific needs and preferences regarding diabetes education. During education, one patient reports: “I find it very important to be informed regarding laboratory results”. This patient also wants to receive more information regarding chemical processes which are important in the case of diabetes mellitus. Another patient wants to receive more information regarding insulin therapy. A third patient reports: “I want to receive information regarding development and treatment of diabetes mellitus”. The fourth and last patient wants to discuss all important diabetes mellitus subjects, but cannot mention relevant themes.

Related to the patients who report needs and preferences, two patients also emphasise the importance of available time regarding diabetes education.

Six patients, all men included, prefer individually-based education above group-based education. One patient, a woman, does not have a preference regarding individually-based or group-based education.

- Group-based education

Four patients report no needs and preferences regarding group-based education. One of these patients reports: “group-based education creates obligations. On the other hand, it can be a stimulus”. Another patient, who also has no interest, reports the importance of participants with different cultures. This patient, who is a woman, reports: “the programme also has to include allochthonous patients”. In addition, the participants have to exhibit a similar age. Two patients give a doubtful answer regarding their needs and preferences. At first, they have no preferences regarding group-based education. On the other hand, they want to think about this possibility. One of these two patients emphasises the importance of information exchange. This patient reports: “I want to exchange experiences and I am curious regarding other patients’ experiences and diabetes management. During a meeting, first it is important

to transfer general information regarding diabetes mellitus. Next, it is important to apply practical information, to realise companion contact and personal contact. The other patient reports the ability to learn from other people. Participation depends on interest, for example when discussing the theme hypo, the patient will participate.

One patient reports needs and preferences regarding group-based education, especially group-based education regarding diabetes mellitus patients who are dependent on insulin. This patient, who is a woman, reports: "I want to repeat all subjects, especially nutrition-based aspects".

Regarding frequency of group-based education, one patient reports to be satisfied with one group meeting. Another patient reports a preference for six to eight group meetings. The frequency has to be one meeting including one theme in the course of two weeks. A third patient reports a preference for four a five meetings. The meetings should be organised during evenings, once a month, and every meeting, the emphasis should be at another theme. During meetings, theme discussion should last one and a half hour. Other time should be spend on questions.

Another patient who has no needs and preferences regarding group-based education reports, when interested for participation, that one meeting in the course of two weeks would be enough. The meeting may last one hour. This patient has no ideas regarding frequency of meetings.

One patient reports: "It is the doctor's task to decide about the frequency of group-based diabetes education". A last patient, who is a man, reports the need for individually-based education, preferably twice a year.

- Internet-based education

Five patients report no needs and preferences regarding internet-based education. Three of these patients possess no computer at home. Regarding the other two patients who report preferences, one patient, who is a woman, reports: "I want to discover more internet-based information regarding diabetes mellitus by connecting an internet link". This person reports a need for diabetes programmes, but does not have an idea regarding content. According to this patient, internet-based information can be more efficient than group-based education.

One patient, who is an allochthonous woman, reports: "I am not able to handle an internet-based programme, because of a reading limitation". Despite these limitations, she reports needs and preferences regarding internet-based education. She wants to receive additional information regarding diabetes mellitus through the help of illustrations and a speaking voice.

She appreciates a diabetes programme which is translated into Moroccan language. During indistinctness, she can look for additional information.

Regarding satisfaction of an internet-based programme, three patients report the importance of comprehensive information.

According to one of these patients, the degree of truthfulness regarding internet-based education is very important. Internet is a manageable medium. Information should only be noted down in Dutch language. An English language should be avoided. Internet has to contain information with respect to content and has to serve as an encyclopaedia for practical questions. Another of these three patients reports the importance of illustrations. This because of a language barrier. The other patients do not mention their expectations regarding internet-based education.

❖ Physical activity

- Physical activities

Three patients report no needs and preferences regarding physical activity. Two of these patients are not motivated or are reporting little time for these activities. Another patient gives evidence of physical limitations regarding physical activity.

The other four patients, who enclose three women and one man, report needs and preferences regarding physical activity programmes. Three patients want to participate in a walking group. Two of these three patients report the importance of participants of the same age, because of strength. One of these two patients reports: “I want to compose a walking group that includes patients with different cultural backgrounds”. During walking, two of the patients want to contact other people. It is important to keep walking groups small, e.g. ten participants or less in a group. The fourth patient reports: “I want to swim more often in a week”.

Besides a walking group which is the most favourite activity, two patients mention other physical activities which are swimming, cycling by means of a home trainer and visiting a school for the martial arts.

During physical activity, two patients report the need for much exercise and less education preceding the exercise.

Regarding frequency of physical activity meetings, three patients do not report needs and preferences. This is related to time restrictions and physical limitations.

The other four patients report an opinion regarding physical activity meetings. One patient reports: “I want to be physical active once in the course of two weeks, at a structural basis”.

Another patient reports: “I want to be physical active once in the course of three weeks or once in the course of four weeks”. The third patient wants to utilise a physical activity programme more times a week and the fourth patient wants to swim two to three times a week in addition to personal activities. According to patients’ needs and preferences, physical activity meetings may last one to two hours.

- Media campaigns

In general, two patients report no needs and preferences regarding media campaigns. This also concerns media campaigns regarding physical activity. One of these patient reports “as long as Wendy, keeps an eye on me”. “Wendy” is an employee in a doctor’s practice who is counselling diabetes mellitus patients. This patient reports the need for information when it is of additional value. The other five patients want to be informed by way of media. They want to be informed by means of television, radio, folders and newspapers about subjects regarding diabetes mellitus in general and more specific physical activity programmes. Two of these patients report the importance of clear and consistent information. One patient reports: “It is important to let the media offer solutions when things are wrong. The media has to prevent inconsistent information”. Two patients report a preference to be informed by way of media channels other than Dutch ones. These media channels are German and Arabic channels. A Moroccan woman reports: “I want to be informed by means of the Arabic channel, because of reading restrictions”. One patient reports the little attention of television regarding diabetes mellitus information in general and particular physical activity programmes. This patient, who is a woman, emphasises the importance of subjects with respect to content and application. It is also important to receive information about other people’s disease management. Finally, another patient reports: “It is important to spread out short lines and to realise a direct approach”.

- ❖ Smoking cessation

At this moment, none of the patients smoke. One of these patients never smoked. With regard to opinions related to smoking cessation-based activities, three patients report no needs and preferences. Two of these patients think that smoking cessation depends on the motivation of patients. One of these three patients reports: “I have no opinion regarding smoking cessation-based activities”. The other four patients report opinions related to needs and preferences regarding smoking cessation-based activities. One patient reports the importance of smoking cessation-based activities without preferring a specific method. The other three patients report nursing interventions as an effective method to support smoking cessation. It can be

motivating and stimulating. Of course, the patients' motivation remains important. Two of these patients also report nicotine patches and chewing gum as a possibility for smoking cessation.

Regarding contact moments in the course of smoking cessation-based activities, three patients report no needs and preferences. One patient reports: "I would be satisfied with one contact moment" and three patients report to have no ideas because they are not smoking anymore.

❖ Nutrition

- Nutrition-based activities

Four patients report no needs and preferences regarding nutrition-based interventions. During past, most patients report a dietician visit to be meaningful. This is meaningful for the collection of information regarding food. Three patients consider a group-based programme regarding food aspects to be meaningful. One of these three patients reports the importance of individually-based counselling, by means of a dietician, as well as a group-based programme. Common information can be reported during a group-based programme and individually-based dietary advices can be reported during individually-based education. This patient, who is a man, situates the next statement: "sometimes, both forms are pleasant". The other two patients report a preference for group-based education above individually-based education. They want to be informed in a group about food aspects. They do not prefer a visit to a dietician. One of these two patients reports: "I want to receive more information regarding healthy food and its preparation".

Regarding food interventions offer, one patient has no opinion because of a lack of needs and preferences regarding food activities. Two patients report individually-based counselling by means of a dietician as sufficient. The other four patients report that nutrition-based interventions are sufficient if there is an emphasis on product information. Information should be practice-based.

- Cooking demonstrations/ supermarket tour

Five patients report no needs and preferences regarding cooking demonstrations. The other two patients report preferences regarding cooking demonstrations. One of these two patients reports the importance of a course which emphasises the preparation of healthy dishes which are not of daily use for example desserts, baking biscuits and preparing jam. This patient, who is a woman, reports: "I find it very important to participate in a group course which pays attention to recipes and tests different foods".

The other patient reports the importance of a cooking course concerning Moroccan recipes. This patient, who also is a woman, is a foreign patient and emphasises the Moroccan kitchen because it differs a lot compared to the Dutch kitchen. She reports: “I find it very important to collect information regarding healthy and unhealthy Moroccan products”. The group course frequency may be once in the course of two weeks. She reports to have no opinion regarding the number of group course meetings.

Regarding supermarket tours, five patients report no needs and preferences. The other two patients, who are a man and a woman, report to experience a supermarket tour as very pleasant. They want to collect information regarding healthy and unhealthy products. The female patient reports: “matters which include food are very interesting”. The male patient reports: “I expect to learn a lot about a supermarket tour along with a dietician. The supermarket tour addresses healthy foods which are very important for a patient with diabetes mellitus”.

❖ General results

The general results enclose outcomes regarding three interview questions. These interview questions concern different health promotion programme elements, conditions and remarks. Regarding different health promotion programme elements which include educational, behavioural, psychosocial aspects and physical activities, four patients report no needs and preferences. In the case of a preference for these programmes, one of these patients reports the importance of a combined health promotion programme. Two other patients do not like an integrated offer. In the circumstance of a preference, they desire meetings which discuss different subjects. One patient, who is a man, reports: “I do not like an integrated offer because some aspects are not relevant for me”.

The other three patients report needs and preferences regarding an integrated health promotion programme. One of these patients, who is a woman, reports the importance of a programme which endures a daily period and emphasises practical and applicable information. This woman reports: “I do not like a programme which encloses a lot of theory”. Another patient desires an integrated meeting which encloses three subjects. This patient, who also is a woman, reports: “time arrangement during a meeting depends on the variety of subjects. The preference for time arrangement is one hour per theme”. The third and last patient reports needs and preferences regarding a today’s programme. This patient, who is a man, reports: “I prefer an integrated programme. The today’s programme has to include education, physical activity and behavioural aspects”.

Regarding conditions related to social worker, point of time, costs and location, the next results are formulated.

- Social worker

All patients report an opinion regarding this condition. Patients report that the social worker has to possess some characteristics.

First, the social worker has to provide goal-oriented care. He or she has to consider patient categories and age specific differences. Second, the social worker has to show personality and has to realise interaction between different patients. Third, the social worker has to provide a clear transfer of information. It is important to discuss patients' management related to data transmission. Fourth, the social worker has to be patient-oriented. He or she also has to possess social skills including persuasiveness and attention for various participants. Fifth and last, the social worker has to be well informed regarding different subjects.

- Point of time

Regarding point of time of a course, four patients report a preference for the evening. One of these four patients also reports: "for me it is possible to participate in a course during midday's. The other patients report a preference for an evening because of other activities by day.

Three patients report a preference for activities during morning. One of these patients reports the importance of exclusion of weekends while another of these patients reports the importance of exclusion of a Friday. In a Moroccan culture, a Friday is considered as a rest day.

- Cost

With regard to course costs, four patients report that course costs are dependent on the offer. The other three patients report that course costs may vary from thirty to hundred and fifty Euro. One patient, who is a woman, reports: "the course budget depends on the learning possibilities".

- Location

All patients report the importance of activities organised nearby their house. They want to participate into activities in their neighbourhood. Three patients also report that they want to participate into activities organised in their district. Two patients report to be dependent on public transport or others transport.

After performing the interviews, most patients experienced the interview as meaningful. In general, it turns out to be difficult for patients to mention health promotion interventions by

themselves. Mostly, the items have to be mentioned first by the researcher before patients can report their opinions.

Three patients, all men, reported a remark. The first patient, who had no needs and preferences, reported: “did the interview bring some additional value for you”? Another patient reported: “I wish I could walk and move more. I wish I had more energy”. The third and last patient reported: “the authorities demand different things. They want to drive back risk behaviour. Sometimes, this can be very difficult. Prevention has not been admitted into the reimbursement package, whereas risk behaviour can be prevented or restrained by adding prevention activities into the reimbursement package. His wife reported: “often, healthy food is more costly than unhealthy food. Subsequently, the patient reported: “Maybe the authorities can invest with regard to healthy food. They can decrease the purchase of unhealthy food by forbidding unhealthy food. Then, patients’ health state can be improved”.

5. Discussion, limitations, conclusion and recommendations

5.1 Discussion

5.1.1 Study findings

This study is conducted to answer the research question:

“Which determinants can be identified, which will be included into an instrument to measure needs, preferences and characteristics of type 2 diabetes mellitus patients regarding health promotion”?

In doing so, this study used the PRECEED-PROCEDE Model as main theoretical framework to measure needs, preferences and characteristics of diabetes mellitus patients regarding health promotion. The study assessed, by way of a literature search, effective health promotion interventions and strategies concerning diabetes mellitus patients (‘state-of-the-art regarding effective health promotion interventions). Eventually, the study investigated the characteristics and opinions of a select group type 2 diabetes mellitus patients’ concerning their needs and preferences regarding health education and promotion in the south and middle of Limburg.

The PRECEED-PROCEDE Model encloses a needs assessment. Regarding health promotion programmes, it is important to include diabetes mellitus patients’ needs, because these patients participate in or receive programme services (Green & Kreuter, 2005). Regarding effective health promotion interventions and strategies, the study results are classified into interventions regarding education, physical activity, nutrition and smoking cessation. All effective interventions are to some extent positively connected to one or more outcome variables. The reported outcome variables are HbA1c-levels, knowledge/ skills, self-care ability and quality of life. All interventions are positively connected to knowledge/ skills. Except smoking cessation, all interventions are positively connected to HbA1c-levels. Other connections are not found. Effective health promotion interventions are diabetes self-management education and combination strategies using dietary (for example cooking demonstrations), physical activity (for example walking groups) and behavioural interventions. Regarding smoking cessation, effective interventions are nursing and workplace interventions and telephone counselling. Patient characteristics, which seem relevant according to literature, are Social Economic Status, educational level and cultural background. The interview results indicate that diabetes mellitus patients particularly report needs and preferences regarding nutrition-based activities and physical activities.

In summary, the determinants, which are identified, are education, physical activity, nutrition and smoking cessation.

When executing the research, during literature search, three combination words, which also enclose patient characteristics, are proven to be less effectively, because they hardly resulted in study reports. One explanation for this finding can be the inadequate supply of articles which contain information regarding patient characteristics.

After searching through relevant databases, professionals in diabetes care are consulted and they mentioned some additional references. An explanation for this addition can be that these social workers used other key words during their search for relevant articles which resulted into a selection of other articles. By consulting these professionals, relevant articles are completed.

Within the included articles, the outcome variable HbA1c- level is mostly expressed in terms of percentages (Hampson et al., 2001; Visser and Snoek, 2004; Mensing and Norris, 2003; Gary et al., 2003; Norris et al., 2002). Expression of a variable in terms of percentages can be an advantage because of the opportunity of comparing findings and its progress. Now, it is difficult to compare percentages and its progress, because different articles and authors report various findings regarding HbA1c-levels. An explanation for this finding can be that authors base their findings on different studies. No information is found regarding expression of the outcome variables knowledge/ skills, self-care ability and quality of life in terms of percentages.

The literature reports general information regarding smoking cessation-based interventions. Concerning physical activity and nutrition-based interventions, much study outcomes are based on a combination of physical activity-based interventions and nutrition-based interventions. In this way, it is difficult to give a description of results which are only based on physical activity or nutrition. On the other side, it is logical to combine physical activity-based interventions and nutrition-based interventions because of its interaction. Largely, a general review is used for describing physical activity-based outcomes (Kahn et al., 2002). However, this review is not specified on diabetes mellitus patients. It is used because of its extensiveness.

As is reported in table 4, which gives an overview regarding the connection between health promotion interventions and outcome variables, it can be assumed that there is mostly a positive connection between health promotion interventions and the outcome variables

HbA1c-levels and knowledge/ skills. Only smoking cessation does not show a connection to HbA1c-levels. Probably, this finding is caused by the fact that smoking has no influence at HbA1c-levels. So, no smoking cessation-based articles focus on diabetes mellitus. The outcome variables self-care ability and quality of life do not report a connection to separated health promotion interventions. Scientific literature reports that there is evidence that self-management programmes have a positive effect on self-care ability and quality of life (Looise et al., 2006). Besides this finding, scientific literature does not report evidence for a positive connection between separated elements of a self-management programme and self-care ability or quality of life. Separated elements of a self-management programme are for example education, physical activity and nutrition-based interventions. Because of insufficient evidence, no connections are found.

5.1.2 Research process

The recruitment of doctor's practices for participating in the project turned out to be quite laborious and took a lot of time. At first, the intention was to select two doctor's practices per region. This option was deviated because of a decelerated process and little interest among doctor's practices for participating into the project. A possible reason for the little interest among doctor's practices can be a high work load among employees. Employees in a doctor's practice, who are counselling diabetes mellitus patients and who have to perform the projects' tasks, perform a lot of duties. Because of these duties, the employees can be restrained to participate in the project. In addition, the recruitment period took place during springtime and summer, which is the employee's holiday season. This may also have delayed the recruitment progress.

After collecting different doctor's practices for participation in the project and after contacting most patients for participation in the interviews, it turned out to be very difficult to include an allochthonous patient into the interviews. An explanation for this difficult recruitment can be a religious, cultural aspect or a language barrier. The allochthonous patient who was selected, refused a recording of the interview. Perhaps, this aspect also can be related to religious aspects. Before starting the interviews, the possibility of selecting patients with different characteristics was not guaranteed because of the difficulty to find patients with different combinations of patient characteristics.

After performing the interviews, the selection of patients with different characteristics is succeeded. This success also has to do with an interim re-adjustment of patient characteristics. In general, most patients, who are mainly women, prefer interventions related to physical

activity and nutrition- based interventions. This has partly to do with the fact that none of the patients are smoking anymore. They reported opinions regarding effective smoking cessation interventions, but do not have to apply these interventions for their own situation. Another explanation is that still nowadays mostly women do the cooking, so they are more interested in nutrition-based interventions. Subsequently, all women report not working outside of the house anymore. This can signify the possibility to be more able to participate in a walking group or a cooking course. Further, it is remarkable that all male respondents report a preference for individually-based education above group-based education. It is difficult to explain this finding.

Mostly, patients report different needs and preferences regarding health promotion. This emphasises the importance of individually tailored interventions. Nowadays, it is important to replace traditional symptom-directed treatments by patient-centred, integrated and proactive health promotion programmes (Mathieu et al, 2006).

When linking the study outcomes to the PRECEDE- PROCEED planning Model, regarding the PRECEDE process, it can be stated that a lot of connections between the different phases are not found in the selected literature nor by means of patients' responses. Mostly, the emphasis is at phase one, which describes the social assessment and phase five, which gives a description of the administrative assessment regarding health promotion.

5.1.3 Comparison to other studies

After conducting the research, it can be stated that mostly patients' reported needs and preferences regarding health promotion are described as effective in scientific literature. In general, this study shows that it is difficult for patients to mention health promotion interventions by themselves. Mostly, the items have to be mentioned first by the researcher before patients can report their opinions.

As far as known, in the period in between literature search and describing research results, no additional information appeared in the database Pubmed.

5.2 Study limitations

As appeared from literature search, most selected articles are from abroad. In the Netherlands, little research is published regarding effective health promotion interventions and strategies concerning diabetes mellitus patients. This is a limitation for the translation of research findings to the Dutch execution of the project "healthy life inside Limburg".

Ideally, a structured literature review needs to be undertaken. Unfortunately, this was not possible within the chosen timeframe.

Mostly, during execution of the interviews, health promotion activities have to be mentioned first by the researcher before patients can report their opinions. This can be a limitation because it can influence patients' answers to the questions.

A last issue, but not a limitation, concerns the small number of patients who are included into the interviews. The interviews are descriptive in nature. Because of the small number of patients, it is not possible to generalise outcomes for an entire diabetes population. This item should be taken into account by interpreting the results of the study.

5.3 Conclusion and recommendations

5.3.1 Conclusion

Identified determinants, which will be included into an instrument to measure needs, preferences and characteristics of type 2 diabetes mellitus patients are education, physical activity, nutrition and smoking cessation. In dealing with the burden of diabetes on health care, it is important to conduct integrated and proactive health promotion programmes for diabetes mellitus patients along with the patients' needs and preferences as a starting point. These health promotion programmes are important to be able to deliver individually tailored interventions.

5.3.2 Recommendations

After conducting the research, some recommendations can be reported. The recommendations are divided in recommendations for the Institution Beyaert Robuust Limburg and recommendations for future research.

Recommendations for the Institution Beyaert Robuust Limburg

Based on this research, the following can be advised:

- For the delivery of individually tailored interventions, it is important to design a measurement instrument which encloses questions related to patients' needs and preferences regarding education, physical activity, nutrition and smoking cessation;
- During development of the measurement instrument, it is important to pay attention to clinimetric characteristics. Clinimetry concentrates on the quality of clinical

measurements. The instrument has to meet a number of requirements, which can be summarised by the “SMART” model (Bos, Huijsmans, Kamp, Renzema, 2001);

- The measurement instrument should be applied systematically and in a large population and it is important to include type 2 diabetes mellitus patients with different characteristics. This is important to receive the required information regarding diabetes mellitus patients’ needs and preferences and to implement appropriate health promotion programmes.

Recommendations for future research

There are clearly many gaps in the scientific literature related to effective health promotion programmes. The recommendations are enumerated below:

- In general, it is important to conduct more research regarding diabetes mellitus patients’ characteristics in combination with effective health promotion interventions. This is important to become aware of effective interventions for patients and to be able to deliver individually tailored interventions;
- More research has to be conducted regarding effective health promotion interventions and needs and preferences concerning type 1 diabetes mellitus patients. Because of the emphasis at type 2 diabetes mellitus patients, type 1 diabetes demands further investigation;
- Related to the steps of the PRECEDE Model from Green and Kreuter (2005), more research should be conducted regarding diabetes mellitus. It is important to give a further description of connections between the different phases;
- It is important to execute more research regarding effective educational-based, physical activity-based, nutrition-based and smoking cessation-based interventions. More research has to be directed at setting, transfer way, method, content, provider, cost effectiveness, intensity and follow-up of interventions. It is also important to conduct more research regarding connections of interventions to the outcome variables HbA1c-levels, knowledge/ skills, self-care ability and quality of life. This research has to be conducted to be more able to tailor appropriate interventions to patients and situations;
- Besides the usage of foreign studies, it is important to conduct more research in The Netherlands. Especially, when the research is performed in The Netherlands, this is important to provide more actual information;

- It is important to measure diabetes mellitus patients' needs and preferences systematically and in a large population with the aim of tailoring appropriate interventions to patients and situations;
- Besides face-to-face interviews, focus group interviews should be used to collect information about type 2 diabetes mellitus patients' needs and preferences regarding health promotion. An important advantage of a focus group interview is the social interaction in the group, which produces free and more complex responses (Iowa State University Extension, 2001);
- In future, it is important to integrate the health promotion programme with policy makers' perception of resources, feasibilities, and policy regarding health promotion. This is important for a successful implementation. The aim is to bring the health promotion programme in harmony with policy regarding health promotion (or vice versa).

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Appendix checklist interview

Introductie van interview

- Mezelf introduceren, dat wil zeggen uitleggen wie ik ben en met welk doel ik deze vragenlijst afneem;
- Doel en functie van het onderzoek weergeven;
- Benadrukken hoe waardevol de visie en bevindingen van patiënten zijn voor het welslagen van het onderzoek;
- Verloop en duur van het interview aangeven;
- Anonimiteit van persoonsgegevens benadrukken;
- Toestemming vragen voor opname. Opnamen van interviews worden na verwerking van gegevens vernietigd.
- Benadrukken dat de mogelijkheid bestaat dat notities worden gemaakt. Dit voor het geval dat opnamen mislukken;
- Bij verkregen toestemming, de opnameapparatuur gaan toepassen.

Kern van interview

| | |
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| Vragen voor interview (* nadere uitleg beneden) | |
| Patiëntenkenmerken | |
| 1. Wat is Uw leeftijd/ Klopt het dat U jaar bent? | |
| 2. Wat is Uw hoogst genoten opleiding?/ Wat is Uw opleidingsniveau? | |
| 3. Wat is Uw geboorteland?/ Klopt het dat Uw geboorteland is? | |
| 4. Wat is Uw godsdienst? | |
| 5. Verricht U momenteel betaalde werkzaamheden buitenshuis? | |

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|---|--|
| <p>6. Wat is/ was Uw beroep? Bent U onlangs/ in het verleden veranderd van baan? Zo ja, welke werkzaamheden heeft U voorheen verricht?</p> | |
| <p>7. Hoe ervaart U uw woonomgeving? (sociale buurt, verkeerssituatie, ervaren veiligheid)</p> | |
| <p>8. In welke mate wordt U momenteel blootgesteld aan *stressvolle factoren (factoren die spanning/ onrust/ druk veroorzaken)?</p> | |
| <p>9. Van welke onderhoudsdosering medicatie (tabletten/ insuline) maakt U gebruik om Uw bloedglucosewaarden (bloedsuikers) zo optimaal mogelijk te houden?</p> | |
| <p>10. Ondervindt U in het dagelijkse leven hinder van *diabetescomplicaties (gevolgen van diabetes mellitus: bloedvaten, ogen, nieren)? Indien ja: Wat is de ernst van deze complicaties?/ Hoe ervaart U de ernst van deze complicaties?</p> | |
| <p>Gedachten over gezondheidsbevorderende interventies/ strategieën</p> <p>Algemene vraagstelling</p> | |
| <p>11. Wat zijn Uw wensen/ behoeften op het gebied van * gezondheidsbevorderende activiteiten (activiteiten die gezondheid bevorderen zoals activiteiten op het gebied van bewegen, voeding, voorlichting, stoppen met roken) in het kader van diabetes mellitus?</p> | |
| <p>12. Van welke gezondheidsbevorderende activiteiten (met betrekking tot diabetes mellitus) maakt U momenteel gebruik?</p> | |
| <p>13. Welk aanbod van gezondheidsbevorderende activiteiten is er binnen Uw huisartsenpraktijk?</p> | |
| <p>14. Welk aanbod van gezondheidsbevorderende activiteiten is er binnen Uw regio?</p> | |

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| 15. In hoeverre komt het aanbod van activiteiten tegemoet aan Uw vraag/ wensen/ behoeften naar activiteiten? | |
| 16. Welke onderdelen/ onderwerpen mist U in het aanbod van gezondheidsbevorderende activiteiten? | |
| Specifieke vraagstelling gericht op onderdelen | |
| Educatie | |
| 17. Wat zijn Uw behoeften ten aanzien van * diabeteseducatie (voorlichting over diabetes)? | |
| 18. Waar dient voorlichting over diabetes (individueel of in groepssetting) volgens U aan te voldoen? | |
| 19. Welke onderwerpen dienen volgens U in de diabetesvoorlichting terug te komen? | |
| 20. Wat zijn Uw behoeften ten aanzien van de uitvoering van diabeteseducatie in een groepssetting (interactieve bijeenkomsten)? | |
| 21. Welke gedachten heeft U over de frequentie van diabeteseducatie (het aantal bijeenkomsten betreffende diabetesvoorlichting)? | |
| 22. Wat zijn Uw behoeften ten aanzien van *internetgerichte educatie (voorlichting)? | |
| 23. Waar dient internetgerichte voorlichting volgens U aan te voldoen? | |
| Bewegen | |
| 24. Wat zijn Uw behoeften ten aanzien van beweegprogramma's? Waar dient een beweegprogramma volgens U aan te voldoen? | |
| 25. Wat zijn Uw behoeften ten aanzien van de frequentie van beweegactiviteiten (het aantal bijeenkomsten betreffende bewegen)? | |

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| 26. Wat is Uw behoefte aan lichamelijke activiteiten die gezelschap en steun bevorderen, vb. opzetten van wandelgroep, “maatjessysteem”? | |
| 27. Wat zijn Uw behoeften ten aanzien van televisie-/ radioreclame, reclameborden en andere *media- activiteiten met betrekking tot diabetes mellitus in het algemeen en in het bijzonder m.b.t. bewegen? Waar dienen deze mediagerichte campagnes volgens U aan te voldoen? | |
| <p>Stoppen met roken</p> <p>28. Wat zijn Uw (algemene) gedachten over de toepassing van stoppen met roken activiteiten: - *schriftelijk advies op maat; - individuele begeleiding; - telefonische begeleiding; - groepscursus; Indien U rookt, wat zijn Uw behoeften ten aanzien van stoppen met roken activiteiten?</p> | |
| 29. Wat zijn Uw behoeften ten aanzien van het aantal contactmomenten (aantal afspraken) met een hulpverlener bij het stoppen met roken? | |
| <p>Voeding</p> <p>30. Wat zijn Uw behoeften ten aanzien van activiteiten gericht op voeding (individuele -/ groepsvoorlichting over voeding/ afvalprogramma's)?</p> | |
| 31. Waar dient het aanbod van *voedingsactiviteiten volgens U aan te voldoen? | |
| 32. Wat zijn Uw behoeften ten aanzien van kookdemonstraties? | |
| 33. Wat zijn Uw behoeften ten aanzien van een rondleiding in een supermarkt/ restaurant? | |

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| <p>Algemeen</p> <p>34. Wat zijn Uw behoeften ten aanzien van de invoering van meerdere onderdelen (*educatieve = voorlichtend, gedragsmatige, psychosociale aspecten, lichamelijke activiteit) in gezondheidsbevorderende programma's?</p> | |
| <p>35. Onder welke voorwaarden zou U gebruik willen maken van bepaalde programma's? Voorwaarden ten aanzien van:</p> <ul style="list-style-type: none"> - Hulpverlener; - Tijdstip; - Kosten; - Locatie. | |
| <p>36. Wat zijn Uw algemene gedachten over gezondheidsbevorderende activiteiten in het kader van diabetes mellitus?</p> | |
| <p>37. Algemene vragen/ opmerkingen</p> | |

Alle gezondheidsbevorderende activiteiten hebben betrekking op diabetes mellitus.

Alle begrippen formuleer ik gemakkelijk en leg ik eenduidig uit.

*Gezondheidsbevorderende activiteiten = activiteiten die gezondheid bevorderen. Heeft betrekking op de onderwerpen voorlichting/ voeding/ beweging/ stoppen met roken;

* Diabetescomplicaties = gevolgen van de diabetes (kan betrekking hebben op ogen, nieren, bloedvaten);

* Stressvolle factoren = factoren die spanning/ druk/ onrust veroorzaken;

* Diabetes mellitus = suikerziekte;

* Diabeteseducatie = voorlichting over diabetes;

* Internetgerichte educatie = voorlichting via internet;

* Mediagerichte campagne = voorlichting via bladen, radio, televisie, reclameborden;

* Schriftelijk advies op maat = schriftelijk advies na het invullen van een vragenlijst; (internetprogramma).

* Voedingsactiviteiten = activiteiten gericht op voeding;

* Gedragsmatige interventies = groepsbegeleiding/ individuele begeleiding/ telefonische benadering;

* psychosociale aspecten = onderwerpen die betrekking hebben op het psychisch welzijn.

Algemene aandachtspunten tijdens het interview

- Tijd bewaken en evenredig over de verschillende onderwerpen verdelen;
- De patiënt niet te snel onderbreken, maar laten uitspreken. Ingrijpen is noodzakelijk indien van het onderwerp wordt afgeweken of indien niet terzake zijnde onderwerpen worden aangebroken;
- Neem een luisterende houding aan;
- Doorvragen; Wat bedoelt U daarmee?
- Samenvatten; Worden antwoorden op de juiste wijze geïnterpreteerd?
- Maak gebruik van stiltes. Stiltes kunnen dienen als denkpauze of om de patiënt verder te laten praten;
- Stel je neutraal op; Verricht geen aannames.

Afsluiting van interview

- Patiënt bedanken voor de medewerking;
- Aangeven op welke wijze de interviewgegevens worden verwerkt;
- Benadruk het vertrouwelijke karakter van het interview;
- Evaluatie van het interview. Hoe is het interview ervaren?