

An eHealth intervention based on
the Guided Self-determination program
for adults with type 2 diabetes
in general practice

by

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Stavanger, 2018
Silje Stangeland Lie

Preface

My work-experience as a physiotherapist, combined with my personal lifelong experience with self-managing a chronic condition, has made me aware of the many challenges in health care practitioner-patient communication. A large part of working as a physiotherapist is to promote health and motivate patients to self-manage their conditions. I always had a great interest in how we as health care professionals are able (or unable) to motivate our patients to instigate or maintain the necessary or recommended treatment measures. This interest led me to conduct my master study on a lifestyle intervention for people with obesity in primary health care. After my masters' study, I was introduced to the research project DiaHealth, focusing on diabetes and eHealth. I was fortunate to get the opportunity to work as a doctoral student in this project. In this thesis, I will describe both adults with type 2 diabetes and registered nurses' experiences with an eHealth self-management support intervention conducted in general practices. This thesis touches upon benefits and drawbacks of eHealth interventions conducted in primary health care, with a special focus on motivation.

Summary

Background

Type 2 diabetes is a chronic, progressive condition requiring each person to manage their symptoms, treatment, and physical and psychosocial consequences of the condition, as well as to engage in healthy behaviors daily. Diabetes self-management is consequently a demanding, lifelong process requiring motivation. Since many adults with type 2 diabetes do not reach all recommended treatment goals, the fundamental starting point for this project was the need for effective and innovative self-management support interventions for this patient group. Earlier research has proposed eHealth as a promising tool in health care for people with chronic conditions, such as type 2 diabetes. Therefore, the self-management support intervention, Guided Self-Determination Program, was adapted as an eHealth intervention (eGSD) for people with type 2 diabetes. This PhD project piloted the eGSD.

Aims

The overall purpose of this thesis is to provide insight into how adults with type 2 diabetes and registered nurses experience the eGSD conducted in general practice, and how the eGSD may influence motivation for diabetes self-management and intervention participation by means of a qualitative approach. The more specific aims are as follows:

- 1) To explore experiences with the eGSD from the perspective of participants who dropped out (paper I);
- 2) To provide insights into their reasons for dropping out (paper I);
- 3) To explore how adults with type 2 diabetes experience using reflection sheets to stimulate written reflection in the context of the eGSD (paper II);
- 4) To explore how written reflection might affect motivation for self-management of type 2 diabetes (paper II);

- 5) To explore how the eGSD influences the patient-nurse relationship from the perspective of patients participating and the registered nurses conducting the intervention (paper III).

Methods

The eGSD pilot study was carried out by registered nurses at eight general practices in south-western Norway from August 2015 to December 2016. Twenty-five patients with type 2 diabetes were included in the intervention by the registered nurses trained in the Guided Self-Determination counselling method. All participants who completed the intervention (n=10), as well as four of the registered nurses conducting the intervention were interviewed individually after completing the intervention based on semi-structured interview guides. Participants who dropped out of the intervention also participated in individual telephone interviews (n=12). The transcribed interviews were analysed using qualitative content analysis and reported in three different papers.

Results

The results presented in the first paper suggest that the participants who dropped out of the eGSD lost motivation to participate in the intervention participation because of these experiences: 1) Frustrating technology, 2) Perceiving the content as irrelevant and incomprehensible, 3) Choosing other activities and perspectives, and 4) Lacking face-to-face encounters. The findings presented in the second article suggest diverse experiences of participants who completed the intervention. Some participants indicated that written reflection in the eGSD affected awareness and commitment in diabetes self-management and positively influenced their autonomous motivation for diabetes self-management, whereas others perceived written reflection as inapplicable in their diabetes self-management. Lastly, the third article explored the influence of the eGSD on the patient-nurse relationship. The findings indicate that both patients and registered nurses experienced the eHealth intervention facilitated reciprocal understanding and flexibility in the relationship. However, they preferred a combination of eHealth and in-person meetings, as this

facilitates clearing up potential misunderstandings and allows for ‘calibration’ of the relationship.

Conclusions and implications

This findings presented in this thesis indicate that eGSD in its present form can be described as a ‘double-edged sword’. The eGSD may support autonomous motivation for diabetes self-management for some adults with type 2 diabetes. Moreover, the eGSD is a new ‘tool’ for registered nurses to deliver self-management support and it may improve the patient-nurse relationship, which may also stimulate patients’ motivation for diabetes self-management. However, as our findings show diverse experiences with the intervention from both patients’ and registered nurses’ perspectives, the current eGSD solution demands adjustments related to the content as well as technological solution before evaluation and implementation in general practice would be feasible.

Certain adjustments of the reflection sheets seem necessary, e.g., simplifying the language and possibly reducing the number of reflection sheets. Moreover, individually allowing participants to choose reflection sheets on which they want to focus on may be necessary to support autonomy for all participants. As well, determining the target group for the eGSD more specifically may be important, and developing knowledge about who is eligible for eHealth could assist optimal allocation of resources in the health care system. A ‘blended’ version may be necessary to realize the full potential benefit of the eGSD, and written asynchronous communication should ideally complement rather than replace in-person contact to maintain patients’ motivation for intervention participation. Providing guidelines and frameworks, as well as practical training for health care professionals in written communication with patients via eHealth may be a priority area for institutions educating health care personnel and delivering health care in the near future.



Picture 1 - Illustrative picture for the eGSD

Abbreviations and definitions

eConsultation: the process of enabling the 'consultative' interaction between health care professionals and patients, using electronic platforms such as a web-page.

eHealth: The use of information and communication technologies (ICT) for health care

eGSD: the self-management support program the Guided Self-determination, adapted as an eHealth intervention for adults with type 2 diabetes.

GSD: Guided Self-Determination, a counselling method for self-management support

HbA_{1c}: Glycosylated haemoglobin

IDF: International Diabetes Federation

MRC: Medical Research Council

PDF: Portable Document Format. An open file format, which is independent of platform and designed for sharing documents

RN: Registered nurse

WHO: World Health Organization

List of papers

This thesis is based on the following papers, which will be referred to in the text by their Roman numerals: ¹

Paper I

Lie, S.S., Karlsen, B., Oord, E.R., Graue, M., Oftedal, B. (2017). Dropout From an eHealth Intervention for Adults with Type 2 diabetes: A Qualitative Study. *Journal of Medical Internet Research*, 19(5):e187.

DOI: 10.2196/jmir.7479

Paper II

Lie SS, Karlsen B, Niemiec CP, Graue M, Oftedal B. (2018). Written reflection in an eHealth intervention for adults with type 2 diabetes: A qualitative study. *Patient Preference and Adherence*, 12 (pp.311-320).

DOI: <https://doi.org/10.2147/PPA.S154612>

Paper III

Lie SS, Karlsen B, Graue M, Oftedal B. (Manuscript) The influence of an eHealth intervention for adults with type 2 diabetes on the patient-nurse relationship: A qualitative study. *Submitted to and in review for Scandinavian journal of caring sciences*.

¹ Papers I and II are published “Open Access”. Therefore, reprint does not warrant permission as long as proper affiliations are provided.

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Part I

1 Introduction

Type 2 diabetes is a chronic, progressive condition requiring each person to manage the symptoms, treatment and physical and psychosocial consequences of the condition, as well as to engage in healthy life style changes to reach recommended treatment goals and avoid serious long-term complications (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002; Powers et al., 2015). The demands of these daily behaviors are challenging, thus, diabetes self-management is a lifelong process that require motivation. Many adults with type 2 diabetes do not reach recommended treatment goals (Bakke et al., 2017), making provision of self-management support for this patient group imperative (Haas et al., 2013). Self-management support refers to ongoing support for implementing and sustaining coping skills and healthy behaviors (Powers et al., 2015). eHealth provides new possibilities for self-management support, as it enables frequent follow up at time-points suitable for the patient. Earlier research has suggested that eHealth is a promising tool in health care for people with chronic conditions, such as type 2 diabetes (El-Gayar, Timsina, Nawar, & Eid, 2013; Eland-de Kok, van Os-Medendorp, Vergouwe-Meijer, Bruijnzeel-Koomen, & Ros, 2011; Yu et al., 2012). However, the effects of eHealth interventions for people with type 2 diabetes are currently ambiguous (Hanlon et al., 2017; Pal et al., 2013), and many interventions have high attrition rates or low uptake (Eysenbach, 2005; Geraghty, Torres, Leykin, Pérez-Stable, & Muñoz, 2013; Varsi, Gammon, Ruland, & Wibe, 2013; Wangberg, Bergmo, & Johnsen, 2008). Accordingly, research on how patients and health care professionals experience such interventions is valuable for the evidence base.

The fundamental starting point for this project was the need for effective and innovative self-management support interventions for adults with type 2 diabetes, to support their motivation for self-management (Powers et al., 2015). Since it is important to understand user-experiences with

eHealth interventions to improve the quality and secure their uptake and effects, this thesis explores both patients' and registered nurses' experiences with an eHealth self-management support intervention for adults with type 2 diabetes conducted in general practices in Norway.

1.1 Background

1.1.1 Type 2 diabetes

The prevalence of type 2 diabetes has increased dramatically in the past few decades in both western and developing countries. The International Diabetes Federation (IDF) estimates that around one in 11 adults have diabetes worldwide. Of these, 90% have type 2 diabetes (IDF, 2017b). The World Health Organization (WHO) describes diabetes as a global epidemic. Public health surveys conducted in Norway (HUNT) indicate that the prevalence of type 2 diabetes is about 5% in adult men and about 3.5-4 % in adult women (Helsedirektoratet, 2016). However, the real number might be twofold, as the incidence of undetected type 2 diabetes is high (IDF, 2017b). The causes for the rapidly increasing prevalence of type 2 diabetes are complex but include hereditary disposition in combination with environmental factors, such as increasing urbanization, rapid cultural and social changes, ageing, as well as social changes in diet and physical activity (IDF, 2017b; van Ommen et al., 2018).

IDF defines diabetes as: *“a chronic disease that occurs when the pancreas is no longer able to make insulin, or when the body cannot make good use of the insulin it produces”*(IDF, 2017a). The pancreas produces insulin, a hormone that incites the body cells to absorb glucose from the blood stream. Our body cells need glucose for the cellular respiration in order to produce energy. Carbohydrates from the foods we eat are broken down into glucose and transported to body cells by the blood stream. Having type 2 diabetes means the body is no longer able

to produce enough insulin or use it effectively. This leads to raised glucose levels in the blood known as hyperglycaemia. Symptoms of diabetic hyperglycaemia are typically increased thirst and urination, fatigue, and infections. Left undiscovered and untreated, hyperglycaemia can result in long-term complications leading to damage and failure of various organs and tissues in the body. This includes cardiovascular disease, neuropathy, nephropathy, cataracts, diabetic ulcers, dental problems, gingivitis, and more (Helsedirektoratet, 2016; IDF, 2017b). Diabetes and its complications are major health threats in most countries and cause more deaths in adults worldwide than HIV/AIDS, tuberculosis and malaria do collectively (IDF, 2017b).

The recommended treatment goals for people with type 2 diabetes in Norway are glycosylated haemoglobin (HbA_{1c}) of <7 %, low-density lipoprotein (LDL)-cholesterol of ≤ 2.5 mmol/l and blood pressure of $\leq 135/80$ mmHG (Helsedirektoratet, 2016). Despite many technical and medicinal breakthroughs in health care for people with type 2 diabetes, healthy lifestyle changes are still extremely important to reach these recommended treatment goals (van Ommen et al., 2018). Adequate diabetes self-management with healthy lifestyle changes, such as a changed diet and increased physical activity, require motivation. Treatment measures for people with type 2 diabetes aim to help people cope with the chronic condition, improve blood glucose control through e.g., the mentioned lifestyle changes, as well as treat cardiovascular risk factors to reduce the risk of microvascular complications and death (Helsedirektoratet, 2016). Recent research has found that even though a higher portion of patients with type 2 diabetes achieved the treatment goals during the last decade compared to previous years, still only one out of every six patients (16%) achieve all recommended treatment goals (Bakke et al., 2017). Therefore, supporting and motivating adults with type 2 diabetes self-management of their chronic condition seem essential in current health care.

1.1.2 Challenges in diabetes self-management, and the significance of support to motivate adequate diabetes self-management

Self-management can be defined as “*the individual’s ability to manage the symptoms, treatment, physical and psychosocial consequences and life style changes inherent in living with a chronic condition*” (page 178) (Barlow et al., 2002). People with type 2 diabetes must conduct most treatment decisions and measures themselves in their daily lives. Patients have described diabetes self-management as difficult to attain both due to lifestyle changes being cumbersome, and due to long-term complications of type 2 diabetes and/or other chronic conditions (Suzuki et al., 2015). Additionally, the values people hold can conflict with behaviors that are recommended for type 2 diabetes self-management (Oftedal, Karlsen, & Bru, 2010). Recommended daily diabetes self-management behaviors, such as physical activity, a healthy diet, and medication regime, may interfere with some people’s priorities and desire to live a ‘normal’ life (Oftedal, 2011). Moreover, one never has ‘time off’ from self-managing type 2 diabetes. The progression of the condition and the daily demands of self-managing diabetes can be emotionally demanding (Haas et al., 2013). Earlier studies have identified a perceived lack of psychosocial support in health care for people with diabetes (Barnard, Peyrot, & Holt, 2012; Nicolucci et al., 2013; Peyrot et al., 2013). These matters points to the importance of providing self-management support to people with type 2 diabetes.

Diabetes self-management support refers to supporting patients implement and sustain coping abilities and healthy behaviours needed to self-manage daily (Powers et al., 2015). Diabetes self-management support differs from traditional diabetes self-management education, as it signifies the importance of *ongoing support* to motivate behaviour change, maintain motivation for healthy behaviours, as well as address psychosocial concerns (Haas et al., 2013). Registered nurses can play an

important role in self-management support for adults with type 2 diabetes (Den Engelsen, Soedamah-Muthu, Oosterheert, Ballieux, & Rutten, 2009; Juul, Maindal, Frydenberg, Kristensen, & Sandbaek, 2012). Addressing psychosocial challenges potentially faced this patient-group, along with the medical concerns and recommendations, may improve the patient-provider collaboration (Stuckey et al., 2015). Collaboration between registered nurses or other health care professionals and patients with type 2 diabetes is essential in order to promote motivation and skills for self-management, and it has been associated with improved patient-reported outcomes (Funnell, 2006; Phillips, 2016).

The overall objective of the Norwegian national guidelines for diabetes treatment states that health care for people with diabetes should support them in living a good life despite having diabetes (Helsedirektoratet, 2016). Many people with type 2 diabetes may need comprehensive support from health care professionals as well as motivation for adequate self-management to achieve best possible quality of life. Given the increasing prevalence of type 2 diabetes and the challenges these patients face in terms of self-managing the condition, it is necessary to develop innovative and effective ways to deliver self-management support to this patient group. The fact that most adults with type 2 diabetes are treated in general practice (Bakke et al., 2017) indicates that self-management support interventions are beneficially delivered in primary health care settings. Interventions in a community context, such as general practices, might also be effective, convenient, and accessible (Powers et al., 2015).

1.1.3 eHealth interventions to support motivation for diabetes self-management

eHealth technologies and interventions are promoted worldwide and they have a great potential to support people in managing chronic conditions, such as type 2 diabetes. They offer new ways of delivering health care at time-points and locations suitable for the patient (Kreps &

Neuhauser, 2010). This thesis use a wide definition of eHealth, as specified by the WHO: “*eHealth is the use of information and communication technologies (ICT) for health*” (WHO, 2017). eHealth technologies include interactive web-sites, web portals, telehealth applications, emailing, online communities as well as diverse automated applications. eHealth thus includes, but is not limited to, the potential for providing health care through technology-based communication tools.

The evidence base of eHealth interventions for diabetes care is rapidly increasing. In the following text, I provide an outline of findings from recently published reviews. A systematic review published in 2013 explored the ways in which information technology (IT) has been used to improve self-management for adults with diabetes (both type 1 and type 2). The review indicates that eHealth (or IT interventions) hold a great promise to support and motivate diabetes self-management. However, the review also address significant issues regarding benefits and adoption of as well as satisfaction with such interventions, and states the existing need to “understand and account for patients’ self-efficacy and other enabling factors in the design and implementation of such interventions” (p.643) (El-Gayar et al., 2013). Another review explored internet interventions to support lifestyle modifications for diabetes management for adults with type 2 diabetes. This study found that the field of web-based interventions for patients with type 2 diabetes is rapidly developing and that such interventions may succeed in reaching patients, promoting lifestyle modifications, and thus supporting the self-management process outside of the clinical setting (Cotter, Durant, Agne, & Cherrington, 2014). A more recent review from 2016 propose that eHealth interventions improve glycaemic control for people with type 2 diabetes (Alharbi et al., 2016). This review claims that approaches with self-management support appear more promising compared to electronic medical records and clinical decision support systems. However, further investigation is still required to increase the understanding of how, why, and when information technology can

improve the care of patients with type 2 diabetes (Alharbi et al., 2016). Another recent review suggests that many types of eHealth interventions have been found to improve self-management behaviours and clinical measures, particularly HbA_{1c}. The study concludes that eHealth is a promising addition to ordinary clinical care, as it addresses the need for ongoing support for adults with type 2 diabetes. However, important factors to consider when developing and implementing eHealth self-management support interventions include participant preferences, the usability of the technology, and personnel's availability to orient or assist participants if they experience user- and/or technical problems (Vorderstrasse, Lewinski, Melkus, & Johnson, 2016). A cross-sectional study demonstrates that the health care professional's ability to motivate patients and support their autonomy appear to directly influence their adherence to eHealth (Graffigna, Barelo, Bonanomi, & Menichetti, 2016). This has implications for the effective design of new technologies and interventions with psychosocial support.

It has been advocated that future eHealth interventions for diabetes care should be theory-based and include counselling techniques (Pal et al., 2013; van Vugt, de Wit, Cleijne, & Snoek, 2013; Webb, Joseph, Yardley, & Michie, 2010). Research has also demonstrated that eHealth self-management support interventions with personally tailored feedback have larger uptake compared to interventions without this feature (Morrison, Moss-Morris, Michie, & Yardley, 2014), and adults with type 2 diabetes express a preference for eHealth interventions with an emphasis on emotional and role management, available at all times (Pal et al., 2018). Constructive relationships with health care professionals are important factors in self-management support, and collaborative eHealth tools may support the relationship between the patient and registered nurses for example (Brandt, Clemensen, Nielsen, & Søndergaard, 2018).

Even though various studies show promising (albeit somewhat ambiguous) effects of eHealth interventions for people with diabetes,

self-management support and counselling via eHealth is not regularly used in primary health care. Thus, there is still a potential for development and research on nurse-led eHealth interventions intending to support and motivate adults to self-manage type 2 diabetes, particularly in general practice where most of these patients are followed over time.

1.1.4 The Guided Self-Determination program as an eHealth intervention

In this project, we responded to the need for the development of interventions to support and motivate self-management of type 2 diabetes by adapting the Guided Self-Determination program (GSD) as an eHealth intervention delivered by registered nurses in general practice (Karlsen et al., 2016). The primary health care setting was chosen for the reasons outlined in previous sections as well as because the majority of patients with type 2 diabetes are treated in general practices (Bakke et al., 2017).

GSD is a self-management support intervention, directed at supporting decision-making and problem-solving and assisting the patients in developing life skills with chronic conditions, such as diabetes. The purpose of GSD is to support and improve each person's ability to self-manage diabetes based on his/her own needs and wishes by being able to share psychosocial aspects, taking active part in goal-setting and treatment decisions, and thus developing positive autonomy and responsibility (Zoffmann, 2004). Self-determination theory, along with empowerment-thinking, life skills theory, and grounded theories, functioned as the philosophical and theoretical basis for the development of the GSD (Zoffmann et al., 2016). The program is based on the idea that there is a potential for change in the patient-provider relationship in order to support mutual understanding and collaboration. It aims to

improve self-management support given to each patient and thus his or her motivation for adequate diabetes self-management.

The GSD was originally developed for people with ‘difficult’ type 1 diabetes, but it has since then been adapted to various other conditions, such as stroke, hemodialysis, and gynecological cancer (Bronken, Kirkevold, Martinsen, Wyller, & Kvigne, 2012; Finderup, Bjerre, Soendergaard, Nielsen, & Zoffmann, 2016; Jørgensen et al., 2015; Olesen et al., 2016). Earlier research has demonstrated some success of the GSD for people with type 1 diabetes mellitus. Positive outcomes include improved life skills (Husted, Thorsteinsson, Esbensen, Hommel, & Zoffmann, 2011; Zoffmann & Lauritzen, 2006), reduced HbA_{1c} (Husted et al., 2011; Zoffmann & Lauritzen, 2006; Zoffmann, Vistisen, & Due-Christensen, 2015), reduced psychosocial and diabetes distress (Mohn et al., 2017; Zoffmann et al., 2015), and reduced amotivation for diabetes self-management (Husted et al., 2014). Moreover, the GSD has improved physical well-being in women with gynecological cancer (Olesen et al., 2016). Finally, yet importantly, adults with type 2 diabetes experienced new life possibilities after participating in the adapted GSD. They became more self-determined, which seemed to have a positive influence on their motivation for self-management (Karlsen, Bruun, & Oftedal, 2018). The current project is the first to conduct the GSD as an eHealth intervention for adults with type 2 diabetes in general practices.

A key-feature of the GSD is the use of reflection sheets. The idea, and some of the sheets, was borrowed from Arborelius (Arborelius & Bremberg, 1988), and the original GSD reflection sheets were developed based on grounded theory studies (Zoffmann, 2004). The reflection sheets provide the patients with a chance to start reflections in the peace and quiet of their homes. This may assist them in becoming active in the health care process and thus make more self-determined decisions. The patient-nurse communication may become more focused on the ‘heart of the matter’ when patients are prepared. By sharing the prompted reflections, the patient and health care professionals, such as registered

nurses, are guided through seven stages of collaboration: (1) establishing a mutual relationship with clear boundaries, (2) self-exploration, (3) self-understanding, (4) shared decision-making, (5) action, (6) feedback from action, and (7) translating evidence for productive patient behaviour in an autonomy-supportive way (Zoffmann et al., 2016). Thus, ideally, an improved patient-provider relationship can be supported through mutual reflection, shared decision-making, and dynamic judgment building, all of which support autonomous motivation for self-management (Ryan, Patrick, Deci, & Williams, 2008). This requires changes by both the patients and the health care professionals to improve their relationship and collaboration. The health care professionals are trained in using advanced communication skills, such as mirroring, active listening, and value-clarifying responses to the patients written reflections when learning the GSD method (Zoffmann et al., 2016). The procedure of the GSD eHealth intervention is explained in detail in the methods section. It is called the eGSD in the following text.

Patients' and health care professionals' experiences can serve as a guiding principle when developing and piloting eHealth interventions. This may improve interventions in the making, and foster patient engagement when implemented (Barello et al., 2015). As far as seen in the literature, no previous study has explored both patients' and registered nurses' experiences with an eHealth self-management support intervention for adults with type 2 diabetes, and the effect of such an intervention on their motivation to engage in the intervention as well as motivation for diabetes self-management.

1.2 Aims

The overall purpose of this thesis is to provide insight into how adults with type 2 diabetes and registered nurses experience the eGSD conducted in general practice, and how the eGSD may influence motivation for diabetes self-management and intervention participation by means of a qualitative approach. The more specific aims are as follows:

- 1) To explore experiences with the eGSD from the perspective of participants who dropped out (paper I);
- 2) To provide insights into their reasons for dropping out (paper I);
- 3) To explore how adults with type 2 diabetes experience using reflection sheets to stimulate written reflection in the context of the eGSD (paper II);
- 4) To explore how written reflection might affect motivation for self-management of type 2 diabetes (paper II);
- 5) To explore how the eGSD influences the patient-nurse relationship from the perspective of patients participating and the registered nurses conducting the intervention (paper III).

1.3 Structure of the thesis

This thesis comprises six chapters. This first introductory chapter presents the objectives of the PhD project and the thesis. Thereafter, the background of the project is thoroughly presented by focusing on the challenges of self-managing type 2 diabetes and hence the need for developing innovative and effective ways of delivering self-management support interventions for adults with this condition. Previous literature on the subject is presented to illustrate the rationale for this research project, followed by an outline of the background of the adapted and piloted intervention, and lastly the overall purpose and the specific aims of the thesis is presented. Chapter 2 presents the theoretical framework of the thesis; specifically, the motivational self-determination theory.

Chapter 3 describes in detail the philosophical considerations, the methods framework, and the methods used in the project. The process of the eGSD intervention is also explained thoroughly. Chapter 4 presents the main findings from the three studies included in this thesis. The findings are discussed considering earlier research and the self-determination theory in Chapter 5. Methodological considerations are also discussed in detail. Finally, Chapter 6 presents the conclusion and implications for clinical practice, suggesting further research directions based on the findings from this thesis.

2 Theoretical framework

The self-determination theory has been developed from empirical motivational research, and is an organismic approach to human motivation and well-being, applied to health care and health behavior change, including self-management of type 2 diabetes (Ryan & Deci, 2017). The self-determination theory was chosen as the theoretical framework in this thesis because the eGSD is theoretically based on self-determination theory and because an objective of the intervention piloted in this project was to stimulate patients' motivation for diabetes self-management. The objective of the following presentation is to illustrate and clarify core constructs of the self-determination theory considered relevant for this thesis.

2.1 Supporting basic psychological needs in health care to improve motivation for diabetes self-management

As described in the introduction, outcomes of type 2 diabetes treatment are highly dependent on each patient's self-management. Self-determination theory suggests health care professionals should attend more carefully to the patient's experience and motivation to improve diabetes self-management and reach the recommended treatment goals (Ryan et al., 2008).

Motivation is central in peoples' lives, and concerns how we move ourselves and people around us to act. The *basic psychological needs* theory within the self-determination theory proposes determinants of and ways to support or improve people's motivation and self-regulation (Ryan & Deci, 2000). The specification of the basic psychological needs for autonomy (an experience of volition and choicefulness), competence (an experience of capability and mastery), and relatedness (an experience of support from and connection with important others) is central to this

theory (Niemic, Ryan, & Deci, 2010). Satisfaction of these three needs is necessary for optimal motivation, physical health, social integration, and psychological wellness (Ng et al., 2012; Ryan & Deci, 2000). Thus, when health care professionals and -approaches are able to support people's sense of autonomy, competence, and relatedness, autonomous (i.e., optimal) motivation for diabetes self-management may be reinforced (Ryan & Deci, 2017).

In the following text, I will specify the three basic psychological needs, as explained by the self-determination theory, and the ways in which these may be supported in health care for people with type 2 diabetes. The concept of *autonomy* is central to human motivation and well-being. Being autonomous means being able to act volitional. Autonomy refers to a congruence between people's abiding values, interests, and priorities, and their actions (Ryan & Deci, 2017). When people can make their own decisions and assessments as well as set goals based on personal experiences and preferences, they may experience a sense of autonomy. Strive for autonomy is important in health care for people with type 2 diabetes, allowing people to autonomously decide self-management goals and choose what they want and on what they have the capacity to focus on in their self-management. However, being autonomous does not equal being independent, as people can also choose to be autonomously dependent or interdependent (Ryan, Legate, Niemic, & Deci, 2012). This is an important consideration in health care and interventions intending to support people's self-management.

Relatedness refers to an experience of having a good and meaningful connection with other people in your life, and to trust and rely on them (Niemic et al., 2010). Having a sense of relatedness is necessary for peoples motivation and well-being related to many aspects of their lives (Deci, Ryan, & Hunsley, 2008), and for internalizing motivation for self-management of type 2 diabetes (see Figure 1). If people feel connected to and trust their health care professionals, they are more likely to adopt the values and behaviors they promote and advise with regards to

diabetes self-management (Ryan et al., 2008). This indicates that having a sense of relatedness to the registered nurse can be important for patients to be able to maintain motivation for the often-demanding behaviors necessary in self-management of type 2 diabetes.

Having a sense of *competence* is described as the third basic psychological need inherent in all humans, and it refers to experiencing capability and mastery of different tasks (Ryan et al., 2008). It may be assumed that individuals with a stronger belief in their competence and ability to master diabetes self-management behaviors more likely initiate such behaviors, as well as put in a greater effort to succeed compared to those who do not believe themselves to master these behaviors. Registered nurses may support a sense of competence in adults with type 2 diabetes through providing knowledge and skills necessary to successfully self-manage the chronic condition. Equally important is positive feedback specifically related to conducted diabetes self-management behaviors. A sense of competence may also be supported if people are able to reach specific (autonomous) diabetes self-management goals, as this increases their feeling of mastery (Ryan & Deci, 2017). This underlines the importance of deciding obtainable main- and secondary goals related to diabetes self-management.

Past research has shown that when the basic psychological needs of autonomy, relatedness, and competence are supported in health care, people will improve and maintain autonomous motivation for the challenging and life-long tasks of diabetes self-management. This may in turn result in improved treatment outcomes such as higher quality of life, improved medication adherence, dietary self-care, and glucose control (Austin, Senécal, Guay, & Nouwen, 2011; Ng et al., 2012; Ryan & Deci, 2000; Ryan et al., 2008; Williams, Freedman, & Deci, 1998; Williams et al., 2014; Williams et al., 2009). Thus, if self-management support approaches, such as the eGSD piloted in this project, and the registered nurses delivering health care can support these basic psychological needs for people with type 2 diabetes, the patients may

become autonomously motivated for self-management behaviors, and consequently achieve improved treatment outcomes.

2.2 *Autonomous motivation for diabetes self-management over time*

Self-determination theory argues that it is more useful to describe the *quality* of people's motivation than the *amount* of motivation for behaviors. Consequently, motivation is described on a continuum from extrinsic (controlled) to intrinsic (autonomous) motivation (Deci et al., 2008). When registered nurses attempt to support and stimulate healthy self-management behaviors in patients, their motivation for this behavior can range from amotivation (unwillingness to engage in an activity), to passive compliance (doing the activity or behavior because of pressure), to active personal commitment (seeing or identifying with the value of the activity or behavior) (Ryan & Deci, 2000).

The different qualities of motivation and behavioral regulation are illustrated in Figure 1.

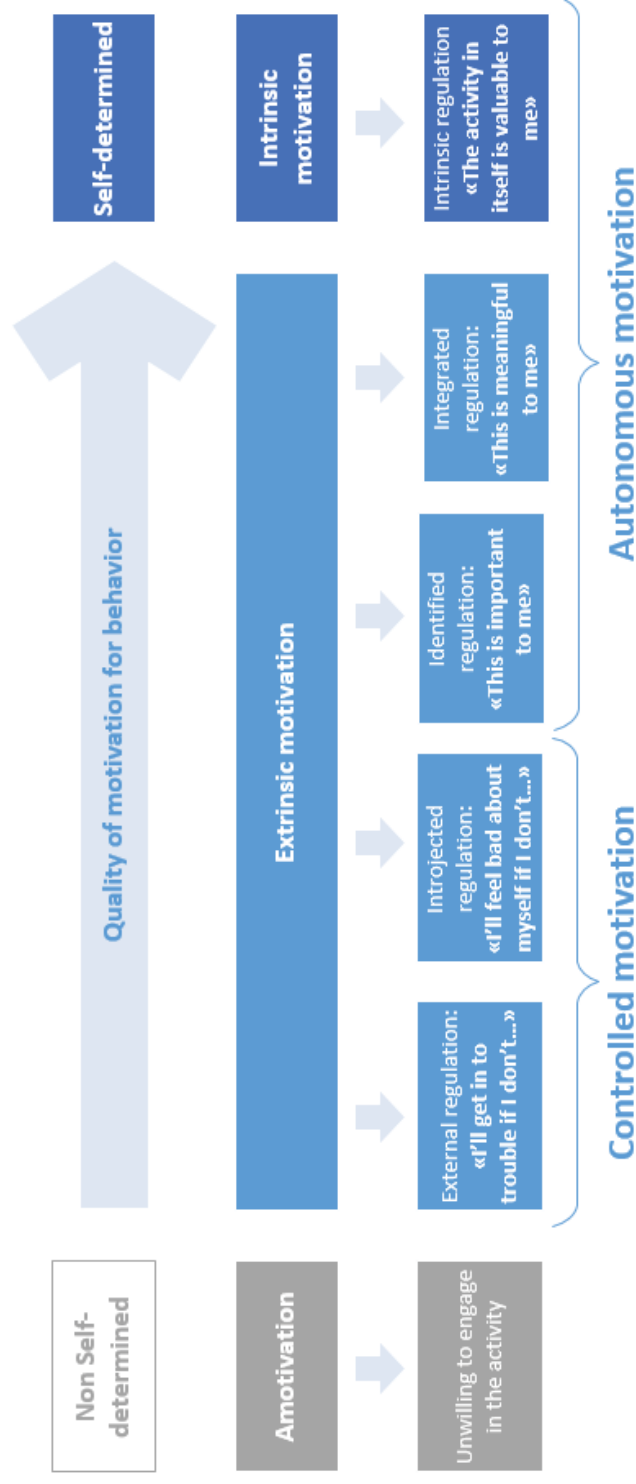


Figure 1 The motivational continuum- adapted from Deci & Ryan, 2000

Motivation for self-management of type 2 diabetes over time requires that patients internalize values and skills for self-management behaviors, and experience self-determination related to these behaviors. The different qualities of motivation illustrated in Figure 1 reflect differing degrees to which the value and regulation of behaviors have been internalized and integrated. Internalization refers to people ‘taking in’ a value or regulation, and integration refers to further transformation of that regulation into a part of themselves (Ryan & Deci, 2000). Such internalization and autonomous motivation may be inspired when people experience fulfillment of the three basic psychological needs described above. Conditions supporting people’s experience of the basic psychological needs for autonomy, competence, and relatedness are argued to foster internalization of behaviors, and the most volitional and high quality form of motivation and engagement for, e.g., diabetes self-management (Ryan et al., 2008). Similarly, being engaged in and completing a self-management support intervention, such as the eGSD, require patients to be motivated for this activity.

The ultimate intrinsic motivation refers to engaging in activities or behaviors because they are experienced as personally interesting or enjoyable in themselves. For many people with chronic conditions like type 2 diabetes, changing behaviors as part of diabetes self-management, or taking part in interventions such as the eGSD, may not be intrinsically motivated (Ofstedal, Bru, & Karlsen, 2011). People may be amotivated, meaning unwilling to engage in the behavior at all, or they may engage in self-management behavior because family members or health care professionals expect or demand it (external regulation, see Figure 1). However, if people are given the proper support of their basic needs such as autonomy in their health care, they may engage in the behavior or activity because they understand and identify with the value of it, and therefore accept it without a sense of pressure or control (identified regulation). Furthermore, basic psychological need support may assist people to assimilate self-management behavior and integrate it with their

view of who they are (integrated regulation, see Figure 1) (Deci et al., 2008). These two latter types of regulation indicate that people can be autonomously, yet extrinsically, motivated to engage in diabetes self-management behaviors or a diabetes self-management support intervention such as the eGSD.

2.3 How the eGSD aims to stimulate motivation for diabetes self-management

As described above, being able to upkeep motivation for adequate diabetes self-management over time requires a sense of volition and behaving in ways congruent with one's values, beliefs, and interests. Having autonomous motivation for diabetes self-management behaviors entails performing self-management behaviors because one identifies with the value and therefore accepts doing what is necessary without a sense of external pressure or control (Deci et al., 2008).

eGSD is a self-management support intervention directed at supporting adults with type 2 diabetes decision-making and problem solving and assisting the them in developing life skills to cope with their diabetes. The objective of eGSD is to improve the patient-nurse relationship by facilitating communication, allowing patients to share psychosocial aspects with the registered nurse, and stimulate patients to self-manage type 2 diabetes based on his or her own needs and wishes by taking active part in goal-setting and treatment decisions. Thus, the intervention aims to stimulate motivation for diabetes self-management in the health care approach (Karlsen et al., 2016; Zoffmann, 2004; Zoffmann et al., 2016). Figure 2 is inspired by the self-determination theory, and it presents a visual model of how components of the eGSD aim to support patients' sense of autonomy, relatedness, and competence to stimulate motivation for diabetes self-management.

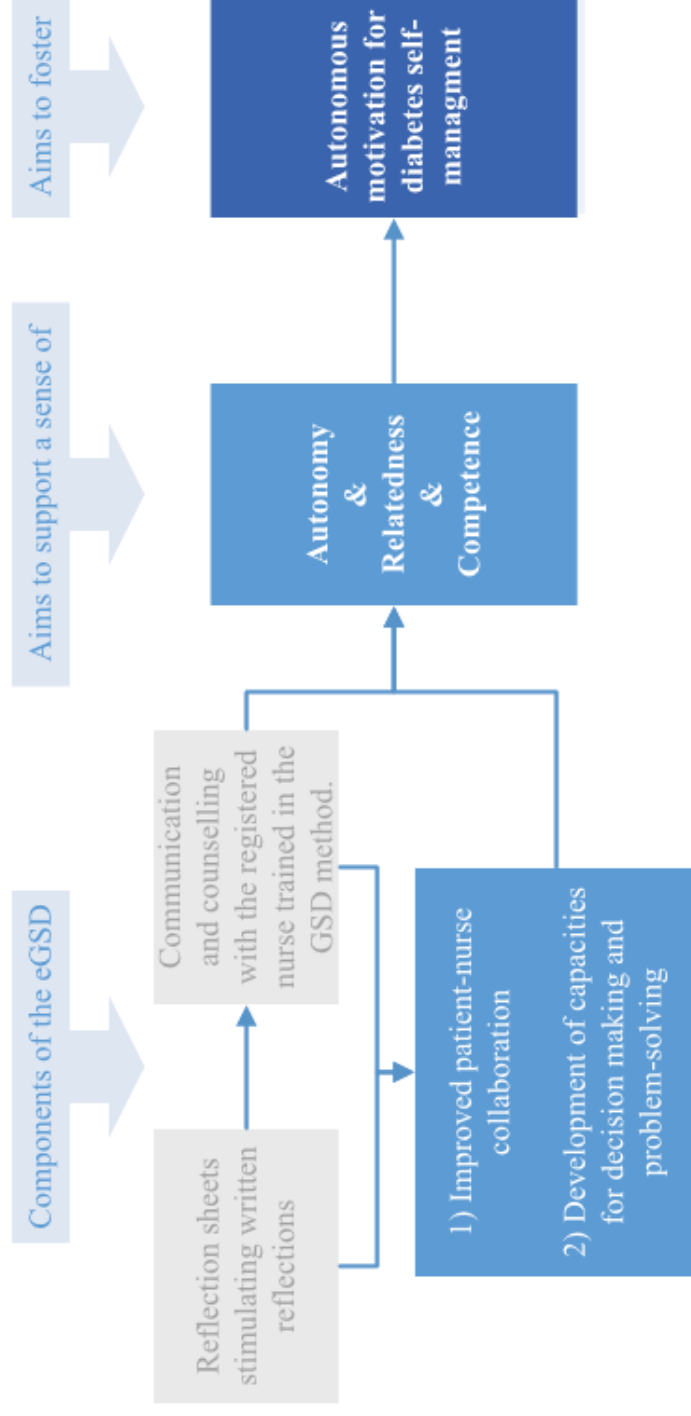


Figure 2 A model showing how the eGSD may stimulate motivation for diabetes self-management

3 Methods

In this chapter, I describe and reflect upon the methods used in this PhD project and thesis. I start by briefly describing the underlying philosophical considerations guiding the choice of qualitative methods in this thesis. Thereafter, I present the research design, the methods framework and provide a detailed description of the intervention. The setting, participants, and data collection of each study are presented subsequently, followed by a description of the analysis-method used in all three papers included in this thesis. Next, issues of trustworthiness and methodological reflections are presented in detail. Lastly, the ethical considerations of the study are described.

3.1 *Philosophical considerations*

Qualitative methods were considered appropriate in this thesis, as the overall purpose is to provide insight into how adults with type 2 diabetes and registered nurses experience the eGSD conducted in general practice, and how the eGSD may influence motivation for diabetes self-management and intervention participation. The focus is to illustrate variations of their experience. Qualitative research belongs within a naturalistic paradigm, and is based on theories from postmodernism and social constructionism where the researcher is an active participant in the development of knowledge (Berger & Luckmann, 1966; Polit & Beck, 2017). Qualitative research sees the world as complex, context dependent and construed from the prevailing personal history, conditions, and culture. Thus, it is concerned with meanings, intentions, and consequences, and the ways in which people make sense of their experiences (Cavanagh, 1997; Kvale, 1996). This philosophical background guides the ontological and epistemological considerations underlying my research. Ontology concerns the philosophy or study of what is the nature of reality and what essentially exists in the world. The ontological assumptions guide a researcher's epistemological view of how we may come to know what we know (Lincoln & Guba, 1985; Polit & Beck, 2017). This permeates the entire research process with data collection and -analysis. As

the qualitative tradition acknowledges several possible interpretations due to subjective descriptions, which can all be valid (Graneheim & Lundman, 2004; Polit & Beck, 2013), the epistemological basis of my research is that both the data and the interpretations of the text are co-creations of the informants and myself as the researcher (Graneheim, Lindgren, & Lundman, 2017). My perspectives and pre-understanding shape the data collection through the conversations in the interviews as well as the data-analysis concerning various aspects of the participants' experiences with the eGSD. The findings are products of my interaction with the informants, and subsequently my understanding and interpretation of the transcribed interviews (Krippendorff, 2013). To ensure trustworthiness of the findings in this thesis, the measures undertaken to ensure credibility, dependability, confirmability, and transferability according to the qualitative tradition as well as an overview of my pre-understanding are presented in Chapter 3.7 and Appendix 9.

3.2 Research design

To pursue the overall purpose, this thesis adopted a qualitative research design. Compared to quantitative methods, which would investigate the effects of an intervention, the qualitative approach instead intends to get an in-depth understanding of experiences with the eGSD (Polit & Beck, 2017). Individual interviews are useful for collecting the qualitative data on experiences and opinions to assess interventions in their real-life context (Sandelowski, 1996), and was therefore used as the method for data collection.

3.3 Methods framework

This current project is a pilot study, which was conducted to inform the development process of a complex intervention, as recommended by The New Medical Research Council (MRC) guidance for developing and evaluating complex interventions (Campbell et al., 2000; Craig et al., 2008). This framework defines complex interventions as including several interacting components. Development phases and feasibility/pilot studies are recommended before conducting larger evaluation studies of complex

interventions, to explore the procedures and applicability as well as participants' experiences with the intervention, to facilitate improvements and informing the design of potential further confirmatory studies of the intervention (Campbell et al., 2000; Craig et al., 2008).

Figure 3, adapted from the MRC framework, shows the process of developing and evaluating complex interventions and places this study in its context. As this doctoral project is a part of a larger project, development of the intervention was carried out prior to the pilot studies included in this thesis (Karlsen et al., 2018; Karlsen et al., 2016). The current Ph.D. project piloted the complex eGSD intervention, as illustrated in blue in Figure 3. The development phase conducted prior to the piloting phase as well as potential future evaluation and implementation phases are illustrated in grey to show the process of the methods framework. The two different versions of the eGSD, as illustrated in the figure, are explained in detail in the section on *The eGSD intervention*.

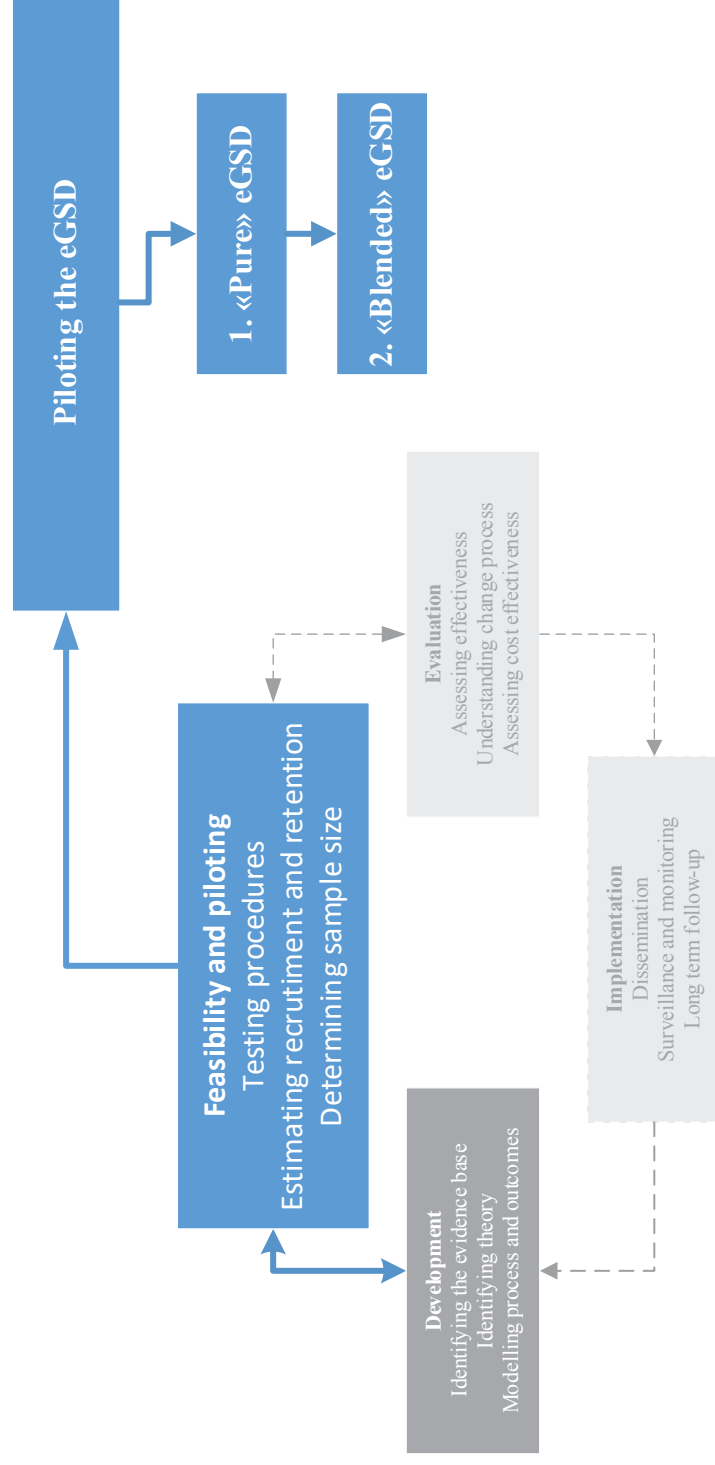


Figure 3 Process of developing and evaluating a complex intervention - adapted from Craig et al., 2008

3.4 The eGSD intervention

3.4.1 Development of the eGSD intervention

The original GSD was adapted to adults with type 2 diabetes and for use as an eHealth intervention in the development phase of this project, as illustrated in Figure 3.² The number of consultations in the intervention was reduced from seven to four, and the number of reflection sheets was reduced from 21 to 13 to make it more time efficient. This process is explained in detail in the study protocol (Karlsen et al., 2016). The research project included user-involvement both in the development phase, as well as in the piloting phase reported in this thesis. User participants (adults with type 2 diabetes recruited from the Norwegian Diabetes federation) as well as health care professionals (registered nurses experienced in diabetes care and involved in the project, and a general practitioner) were included in advising the development of the intervention. They assisted in determining which reflection sheets should be retained or removed and whether the eGSD should be conducted as a ‘pure’ or a ‘blended’ eHealth intervention, and they approved the web-solution as manageable for the particular patient group.

As shown in Figure 3, the pilot study was conducted in two waves. Based on discussion with and advice from the registered nurses involved in the project and the resource group, we initiated the eGSD as a ‘pure’ eHealth intervention. This encompassed one in-person meeting at the general practice prior to the intervention start. Thereafter, the patient and registered nurse conducted the eGSD intervention and communicated only via secure web messages (see Figure 4). This ‘pure’ eHealth intervention was conducted between August 2015 and April 2016. It took the patients between 12 to 35 weeks to complete the intervention using this approach. Because of the long duration and based on discussions and recommendations from the registered nurses conducting the intervention, this approach was changed to a ‘blended’ version of the

² For information about the original GSD, see chapter 1.1.4 in this thesis, the thesis by Zoffmann (2004), as well as the article by Zoffmann and Kirkevold (2012).

eGSD for the second half of the participants. This entailed an additional meeting following the third eConsultation. Apart from this additional meeting, the content of the intervention was identical in the two versions. The reason an additional meeting was conducted as a part of the third eConsultation is because the reflection sheets belonging to eGSD part three aim to guide the patient and registered nurse in collaboration to reflect on the patients' challenges, and work on dynamic problem solving (see reflection sheets 3a-c, Appendix 5). The registered nurses believed that it would be more efficient to work with these particular reflection sheets during an in-person meeting. As this was a pilot-study, we judged it appropriate to change the course of the intervention based on the participants' experience and advice. The 'blended' version of the eGSD was conducted with the patients included from May 2016 to December 2016, and the patients completed this eGSD-version in about 12 weeks.

3.4.2 Description of the eGSD intervention

Figure 4 presents an overview of the eGSD for adults with type 2 diabetes. The first in-person meeting at the general practice, the four eConsultations and their progressive focus are presented, along with topics of the 13 reflections sheets.

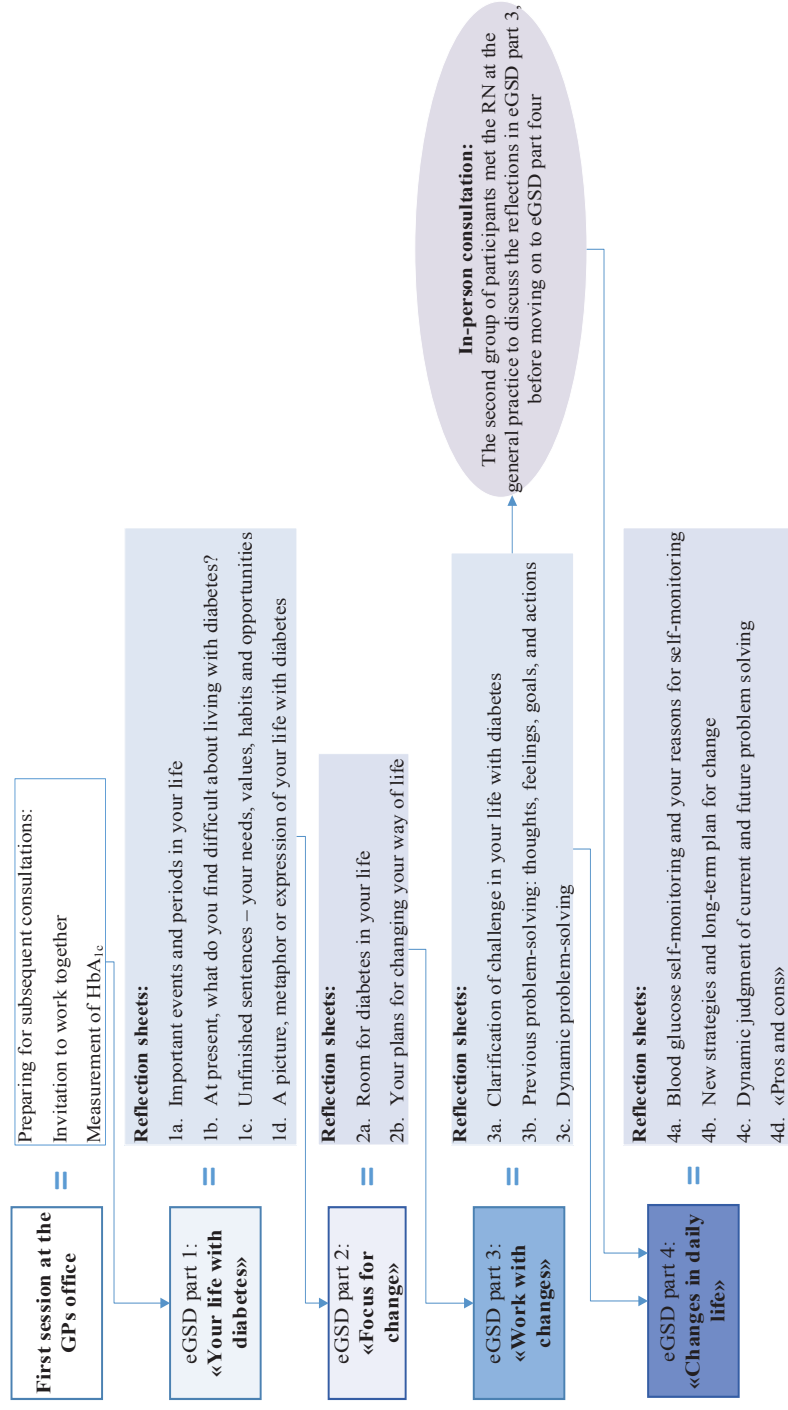


Figure 4 Overview of the eGSD

The four eConsultations aim to guide the patient through a process of becoming empowered in the self-management process. The reflection sheets and advanced communication is intended to enable the patient and the registered nurse to establish a collaboration in which the patient can clarify his/her own values and needs. The reflections sheets also intend to support people in prioritizing problems and prompt self-determined goal setting (Zoffmann et al., 2016). The reflection sheets used in the eGSD are presented in their full form in Appendix 5.

The patients completed the electronic reflection sheets during each of the four eConsultations, to help them become actively involved in the health care process. By reading patients' written reflections, the registered nurses learned about their specific difficulties, such as what they currently found difficult about living with diabetes, their plans for change, and previous and current problem-solving. In response to the patients' written reflections, the registered nurses used communication skills such as mirroring, 'active listening', and value-clarifying responses in writing (or in person during the third consultation of the 'blended' eGSD) to mutually explore these challenges.

A major difference between the original GSD and the eGSD was that the communication and counselling was conducted primarily via written text using secure messages in eGSD. The interaction process was asynchronous, meaning there was a time-delay between the messages. Thus, the patients and registered nurses could engage in the intervention at suitable time-points. Even though the patients completed reflection sheets at home also in the original GSD, they subsequently met with and verbally communicated in real-time with their registered nurse during regular in-person consultations.

3.4.3 The web solution www.MinJournal.no

The eGSD used a secure messaging service provided by the portal www.MinJournal.no. The portal's secure messaging system demands

login with electronic identification (BankID), which provides the highest level of security (security level 4). Norwegian law requires this for web-based sensitive information transfer, such as asynchronous communication between patients and health care professionals. Pictures of the web-page and user interface are presented in Appendix 4.

3.5 Setting, participants, and data collection

Table 1 provides a schematic overview of each of the papers; the aims, the two versions of the eGSD, the participants, data collection, and analysis method. The details are explained thoroughly in the following text.

Table 1 Overview of the eGSD, participants, data collection and analytical approach for each paper

Paper	Aim	eGSD version	Participants	Data collection	Data analysis
I	Explore experiences with the eGSD from the perspectives of those who dropped out and provide insight into their reasons for dropping out	‘Pure’ eGSD	12 patients who dropped out of the intervention	Individual telephone interviews (n=12)	Qualitative content analysis
II	Explore how participants experience using reflection sheets to stimulate written reflection in the context of the eGSD, and how written reflection might affect motivation for self-management of type 2 diabetes	<div>‘Pure’ eGSD</div> <div>‘Blended’ eGSD</div>	<div>5 patients who completed the intervention</div> <div>5 patients who completed the intervention</div>	Individual interviews (n=10)	Qualitative content analysis
III	Explore how the eGSD influence the patient-nurse relationship from both perspectives	<div>‘Pure’ eGSD</div> <div>‘Blended’ eGSD</div>	<div>5 patients who completed the intervention</div> <div>5 patients who completed the intervention</div> <div>4 registered nurses</div>	Individual interviews (n=14) ³	Qualitative content analysis

³ Individual patient interviews (n=10) same as in paper II

3.5.1 Setting

Registered nurses trained in the GSD method and experienced in diabetes care delivered the eGSD to patients at eight general practices in southwestern Norway.⁴ The eGSD was delivered along with regular care, which for individuals with type 2 diabetes in Norway consists of structured annual consultations with a general practitioner and/or a registered nurse working with diabetes care at general practices. In addition the patients are recommended to regularly measure their HbA_{1c} and have additional consultations with the general practitioner or registered nurse as per individual needs (Helsedirektoratet, 2016).

3.5.2 Participants

3.5.2.1 Patients

The participants in study II and III were recruited from eight general practices involved in the project. The patients were initially included in the intervention according to the following criteria: diagnosed with diabetes >3 months, age >18 years, able to communicate in writing in Norwegian, regular access to internet and computer, and having registered a BankID (secure personal electronic identification needed to access the web page). Exclusion criteria were severe physical or mental illness that would limit the patients' ability to participate in the intervention. Ten out of the 25 participants initially included in the eGSD

⁴ The GSD training were offered to all registered nurses who agreed to participate as study nurses in the project. It consisted of 4 days of lectures, as well as practical training. The developer of the original GSD (Vibeke Zoffmann) taught the lectures. She presented the background and theory of the GSD, and the course included practical training in the advanced communication techniques used in the GSD (mirroring, active listening and value-clarifying responses). As part of the training the registered nurses conducted practical training in the GSD method with patients at their own general practice. The course concluded with a multiple-choice test. Registered nurses experiences with learning to practice the GSD is reported in a previous study (Ofteidal, Kolltveit, Zoffmann, Hörnsten, & Graue, 2017)

completed the intervention. After they had completed the intervention, the registered nurses asked if they were willing to take part in an individual interview with a researcher at a place and time of their choosing. The doctoral candidate (thesis-author) contacted the participants individually to plan the time and location for the interview after they had confirmed their willingness to participate. The studies (reported in paper II and III) thus included 10 adults with type 2 diabetes who had completed the eGSD intervention (6 female, 4 male). Half of them completed the ‘pure’ eHealth version, and the second half completed the ‘blended’ version. Their characteristics are presented in Table 2.

The participants in study I were recruited from the sample of patients who dropped out of the ‘pure’ eHealth intervention. Eighteen adults with type 2 diabetes were included in the ‘pure’ eGSD by the registered nurses at four general practices in southwestern Norway. However, 13 of these exited the intervention. The registered nurses who conducted the intervention invited all the patients who had dropped out to take part in a telephone interview with a researcher. One person declined and 12 agreed. The characteristics of the 12 patients included in study I from the sample who dropped out from the intervention is presented in Table 2.

Methods

Table 2 Characteristics of the patients interviewed in paper I, II and III

Characteristics	Patients in paper I	Patients in paper II and III
Sex (n)		
Female	2	6
Male	10	4
Age (mean years, range)	56 (44-73)	51 (39-64)
HbA_{1c} (mean %, range)	7.2 (5.8-10.0)	7.5 (6.0-9.7)
BMI (mean kg/m², range)	-	32 (25-39)
Diabetes duration (median years, range)	9 (2-15 years)	4 (3 months-15 years)
Living situation (n)		
Alone	2	1
With family	10	9
Educational status (n)		
Higher education >4 years	0	1
Higher education <4 years	4	4
Upper secondary education	5	4
Primary school	3	1
Occupational status (n)		
Working full-time	10	6
Working part-time		1
Retirement pensioner	1	1
Receiver of disability benefit	1	1
Unemployed		1
Diabetes treatment (n)		
Diet only	4	3
Oral or other medications	6	5
Insulin	2	2

3.5.2.2 Registered nurses

In addition to patients, four registered nurses who conducted the eGSD as a ‘blended’ eHealth intervention were included as informants in study III. These nurses had been purposively recruited as study nurses in the project. Their age ranged from 47-63 years, and they all had several years of experience in diabetes care (from 7-10 years). One of them had formal postgraduate education in diabetes care. All had attended the training in GSD counselling. After completing the intervention with their patients, the registered nurses were invited to participate in interviews with the author of this thesis.

3.5.3 Data collection

The data for paper I was collected by individual telephone-interviews. Telephone interviews were chosen because they are considered less time- and energy-consuming for participants compared to face-to-face interviews (Mealer & Jones, 2014; Novick, 2008). This was perceived as minimally invading and therefore beneficial, as these participants had dropped out of the intervention. The participants did not have a relationship with the investigator, which means they potentially could answer candidly. However, the lack of non-verbal cues could lead to some missing information. The author of this thesis conducted all interviews, and directed the conversation according to a semi-structured interview guide (Appendix 6). The main question that invited the participants to speak freely was expressed as: “What was your experience with the GSD eHealth counseling intervention?” Supplementary questions were asked during the conversation to invite clarification and elaboration. Examples were, “When and why did you exit the intervention?” “What were your expectations?” and “How did you experience written communication with your nurse via secure messaging?” The interviews lasted on average 20 minutes, and they were audiotaped and subsequently transcribed verbatim. In addition, demographic and clinical data were collected by a questionnaire, which

the participants completed when they agreed to participate in the intervention and study.

The data for paper II and III were collected through individual interviews, either at a conference room at the university or in an office at the general practice from which the patient was recruited. The participants were able to choose the location and time. A semi-structured interview guide was used to organize the interviews (Appendix 7). The participants were invited to speak freely about the theme addressed in the main question, namely, “What was your overall experience with the GSD eHealth counselling program?” During the conversation, the interviewer asked supplementary questions to clarify and elaborate on the participants’ responses, including “How did you experience writing your reflections on the digital reflection sheets?” and “How did writing reflections influence your motivation for diabetes self-management?” At the end of each interview, the participants were asked to supplement their responses with other experiences related to the eGSD to ensure adequate representation of their perspectives. On average, interviews took 70 minutes to complete, and all interviews were audiotaped and transcribed verbatim. Demographic and clinical data were collected at baseline via a questionnaire.

In addition, the four registered nurses involved in the ‘blended’ eGSD were individually interviewed for paper III. These included only half of the nurses who conducted the intervention. However, the four registered nurses who conducted the ‘pure’ eGSD intervention had been interviewed for a different study, and their data was therefore not included in this thesis. The doctoral candidate performed all interviews used in this thesis. A thematic semi-structured interview guide directed the conversation to ensure as much coverage of the topics as possible (Appendix 8). The main question was expressed this way, “What were your overall experiences with conducting the GSD counselling via internet for patients with type 2 diabetes?” One example of a

supplementary question was: “How did you experience the relationship between yourself and the patient when conducting the eCounseling?”

3.6 Data analysis

Qualitative content analysis, as described by Graneheim and Lundman (2004), was used to analyze the data in all three studies. This method was chosen because it focuses on identifying differences and similarities in the text, organizing the content, and interpreting the participants’ experiences (Graneheim et al., 2017). The qualitative content analysis was conducted in a data-driven or conventional manner (Graneheim et al., 2017; Hsieh & Shannon, 2005). This was considered appropriate and in line with the aim of the study. The manifest content is presented as categories, and the latent content was interpreted and is presented as themes. Both manifest and latent content require some degree of interpretation; however, the interpretations vary in depth and level of abstraction (Graneheim et al., 2017). The data-driven analysis means the text was initially openly read, and that the codes, categories and themes emerged from the data, not from pre-defined categories emanating from theory, as would have been the case in a deductive qualitative content analysis process. The outline of the analysis process is presented in Table 3.

In all three papers in this thesis, I have attempted to stay close to the text with concrete descriptions and interpretations. Thus, I formulated what can be called descriptive themes (Graneheim et al., 2017). However, the interpretation and abstraction level differed slightly in the three papers. In paper I, I present one main theme based on four categories. The categories represent manifest content, close to what the participants described in the interviews. This was seen as appropriate, both because of the relatively short telephone interviews, in addition to the aim being to explore experiences with the eGSD and reasons for dropping out. In papers II and III we abstracted and interpreted the findings slightly more through the analysis, and the results are consequently presented as

subthemes and main themes reflecting the latent content of the text. Presenting the latent content was considered appropriate both because of the procedure of the data-collection (one hour-long in-depth interviews) and because of the aims of the articles.

Moreover, it was considered appropriate to use the same analytical method, particularly in paper II and III, as they used some of the same data-material.

Table 3 Steps in the qualitative analysis process

Step	Action	Description	Participants
1	Open reading	Read the whole unit of analysis to get familiar with the text and gain an impression of what was being expressed.	Doctoral candidate and co-authors
2	Identifying meaning units	Statements and patterns in the data responding to the aim of the study were identified and highlighted.	Doctoral candidate
3	Condensing meaning units	Relevant meaning units were condensed, meaning shortened while retaining the main content.	Doctoral candidate
4	Creating Codes	Coded the meaning units into a formalized written style to enable systemizing the data for the analyses.	Doctoral candidate
5	Sorting codes into categories	Compared and sorted the codes into categories based on their differences and similarities. Categories represent the manifest content of the text. Tentative categories were discussed and revised in the research group several times.	Doctoral candidate and co-authors
6	Formulating final theme(s)	The content of the categories was formulated into sub-themes, and/or one or more main themes. Even though formulating themes entails interpretations to represent the latent content of the text, this study's aim was to formulate descriptive themes, representing the participants' experiences.	Doctoral candidate and co-authors

3.7 Research quality

An important question when judging the value of qualitative research is how one can establish trust in the results and consider them transferable to other settings. In the following, the concepts of credibility, dependability, confirmability and transferability illuminate the *trustworthiness* of the findings in this thesis, in accordance with recommendations from the qualitative methods literature (Graneheim & Lundman, 2004; Lincoln & Guba, 1985). The initiatives taken throughout the course of the research project in order to ensure trustworthiness of the study findings followed the COREQ checklist (Tong, Sainsbury, & Craig, 2007)(Appendix 9), and are presented below.

3.7.1 Credibility

The concept of credibility refers to the process of conducting the study to enhance the trust of the findings (Lincoln & Guba, 1985) as well as ensure that the data and the analysis address the intended focus of the study and that the results (categories and themes) reflect the data accurately (Graneheim & Lundman, 2004). To increase the credibility of the studies, I demonstrate the link between the results and the data-collection by attaching the interview guides (Appendices 6-8), and present an overview of the analysis process. Direct quotations from the participants in the findings-section of each paper is also included to illustrate their experiences (Polit & Beck, 2017).

All patients included in the study, as well as the registered nurses, had experiences with the same eHealth intervention, providing unique perspectives regarding the specific research question of each study. Thus, the overall purpose of this thesis is illuminated from different perspectives, which may be argued to improve the credibility of the findings (Graneheim & Lundman, 2004).

3.7.2 *Dependability and confirmability*

Dependability is an expression used within the qualitative research tradition to refer to judgements regarding the stability of the findings. Confirmability is understood as the consistency of the data and findings (Lincoln & Guba, 1985). To ensure dependability of the data-collection, the interview guide for the patient interviews in papers II and III were initially tested on two people with type 2 diabetes. The purpose of the trial interviews was to test whether the formulations of the questions were comprehensible. As these persons had not participated in the eGSD, their responses were not included in the studies. Based on the trial interviews, some small changes concerning the formulation of questions were made to make the questions more understandable.

In addition, the fact that the second half of the participants were asked additional questions in the interview concerning experiences with the in-person meeting as part of the third eConsultation needs mentioning. Apart from this the interview guides for the patients who completed the intervention were similar. The interview guide was semi-structured, therefore, the structure of each interview was adapted to the particular informant and conversation. However, it is important to underline that all interviews included the main questions.

To strengthen the confirmability of the three studies in this thesis, both the doctoral candidate and the co-authors read the transcribed interviews so that all authors had a sense of what the text concerned. Our different pre-understanding influenced our opinion of the meaning of the text. These differences in opinions led to useful discussions concerning categories and themes in the analysis, and they may have strengthened our analysis through presenting the most probable interpretation of the data from our perspective, as described in the methods literature (Graneheim et al., 2017; Graneheim & Lundman, 2004). However, I

cannot rule out that other researchers, with other perspectives, would have interpreted the texts differently.

3.7.3 *Transferability*

Transferability, i.e., the degree to which the findings can be transferred to other contexts and settings, is an important aspect of qualitative research (Graneheim & Lundman, 2004; Lincoln & Guba, 1985). The papers as well as this thesis intended to describe the intervention and its procedure in close detail, as well as give information about the informants, the data collection, and the process of the analysis, as well as the researcher's pre-understanding. In this way, I invite the reader to understand the setting and the progress of the project. These matters are reported in the text (for a complete overview see Appendix 9).

I find it important to state that in the current study, registered nurses working at general practices were purposively recruited to participate as study nurses, as they had to attend training in the GSD counselling method. These registered nurses recruited own patients to the intervention, following the inclusion and exclusion criteria described in the section on *Participants*. Still, I do find it reasonable to assume that our findings may inform other eHealth interventions in Norwegian primary health care as well as interventions targeted at adults with type 2 diabetes.

3.7.4 *Pre-understanding*

As mentioned in the section on *Philosophical considerations*, the theoretical pre-understanding, the interest, and expectations of the researcher influence qualitative research as well as other types of research (Chew-Graham, May, & Perry, 2002). I have an underlying assumption that the text can be interpreted from several perspectives and does not hold one single truth (Krippendorff, 2013). My academic

perspective and point of view are from within the field of health research. The professional identity of the researchers play an important role in constructing what data are developed in interviews (Chew-Graham et al., 2002). I am a physiotherapist myself, and I interviewed registered nurses working at general practices, as well as their patients. The registered nurses and I have different professional education, background, and pre-understanding. However, we have common experiences working with this patient group in health care. Our different professional background and pre-understanding may enhance understanding of our different roles.

My pre-understanding throughout the research process is characterized by the fact that I worked closely with the registered nurses through the process of conducting the eGSD intervention. Furthermore, it is important to note that the self-determination theory informed both components of the intervention and the interview guides. Thus, motivation as understood by self-determination theory is an important aspect of my preunderstanding, and motivation is an underlying theme being explored in this thesis.

In addition, it should be mentioned that I have type 1 diabetes myself, and I presented this to the informants when introducing myself during the interviews. This fact influences my understanding of living with the diabetes diagnosis and being motivated for diabetes self-management. This knowledge may entail that the research questions asked can be relevant, nuanced and comprehensive. However, there is a risk of being an “insider” and being blind to alternative explanations (Robson, 2002). In addition, mentioning this fact to the informants at the beginning of each interview could have influenced their perception of me. The informants perception of me was probably also influenced by the fact that I introduced myself as a “doctoral student” rather than a “researcher”. Informants’ perceptions of the interviewer do affect interview interactions and what the informants express (Richards &

Emslie, 2000). I focused on creating a conversational atmosphere in the interview situation.

I believe these issues are not necessarily limitations or strengths of the studies, but something that should be reported and considered to create transparency.

3.8 Ethical considerations

This project was conducted according to the ethical principles guidelines set out in the Helsinki Declaration ("World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects," 2013). The Norwegian Regional Committee for Medical and Health Research Ethics (REK west No.2015/60) approved the project and the included studies. The approvals are presented in Appendix 1.

The recruited registered nurses and patients were asked prior to intervention-start to participate in individual interviews with a researcher following the intervention. They signed a written consent form prior to the collection of the data material, and they were informed about the right to withdraw from the study at any time. Anonymity was ensured by severing the link between names or ID numbers and transcripts of the interviews. The number of participants in the studies were limited to the people who were included as patients in the eGSD, and the registered nurses involved in the pilot project. Therefore, the findings are presented in a manner that allows for anonymity. Furthermore, the demographic data were collected using questionnaires. The patients returned the completed questionnaires to the researcher by post, and they were only identifiable by ID-numbers. The registered nurses kept the coding keys secure at the general practices, and the researcher did not have access to the codes. Thus, the questionnaires were not connected to the interviews to ensure anonymity of the participants. However, the researcher

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received an overview of ID-numbers of participants who dropped out and who completed the intervention from the registered nurses. This data was registered anonymously.

4 Summary of the results

The studies in this thesis explore experiences with various aspects of the eGSD from the perspectives of patients who dropped out of the ‘pure’ eGSD intervention (study I), patients who completed one or the other version of the intervention (study II and III), as well as the registered nurses who conducted the ‘blended’ eGSD intervention (study III). In the following section, the results from each study are presented as summaries from the papers reporting the studies.

4.1 Paper I: Dropout From an eHealth Intervention for Adults with Type 2 diabetes: A Qualitative Study.

The aim of this paper was to explore how participants who dropped out experienced the intervention, as well as their reasons for dropping out. We identified one overall theme: *Losing motivation for intervention participation*. This theme was illustrated by four categories related to the participants’ experiences of the eHealth intervention. The first category, “*Frustrating technology*” focuses on how participants felt frustrated by the technology used in this eHealth intervention. They described difficulties in navigating the web page due to errors with the portal, and perceived the web solution as time-consuming and tiring. The second category, “*Perceiving the content as irrelevant and incomprehensible*” concerns some participants not seeing the content of the GSD as tailored to their needs and expectations regarding a diabetes self-management intervention. They expressed they could not identify with some of the issues raised in the reflection sheets and did not consider the content relevant to their diabetes self-management. The third category, “*Choosing other activities and perspectives*” represents the participants’ narratives of more important priorities in their lives than the GSD eHealth intervention. Going online and engaging in the GSD eHealth

intervention was considered less important than other matters requiring attention, and the participants therefore chose to minimize their engagement with it. The fourth and last category, “*Lacking face-to-face encounters*” concerns the experience of missing the dialogue, and a preference for face-to-face encounters with their registered nurse. Patients emphasized the importance of meeting the registered nurse and communicating in person as a motivating factor. The participants also stated that answering questions verbally was easier than writing down the answers, and that they would rather talk with the nurse in regular consultations. In addition, having eConsultations without a scheduled appointment with the nurse was considered less binding compared to regular health consultations.

In summary, the discouraging experiences led participants to lose motivation and drop out of the eGSD intervention. To maintain motivation, our study emphasized the importance of combining eHealth with regular face-to-face consultations. Our study also shows that the perceived benefit of the eGSD intertwined with choosing to focus on other matters in complex daily lives are critical aspects in motivation for such interventions. This indicates that to recruit eligible participants, it is important to give potential participants tailored information about the objective, the content, and the effort needed to remain engaged in the eGSD. Finally, it seems important to facilitate more user-friendly but high-security eHealth technology.

4.2 Paper II: Written reflection in an eHealth intervention for adults with type 2 diabetes: A qualitative study.

The study presented in paper II aimed to explore how adults with type 2 diabetes experience using reflection sheets to stimulate written reflection in the context of the eGSD, and how written reflection might affect their motivation for self-management of type 2 diabetes.

The qualitative content analysis yielded two main themes. The first theme, “*Written reflection affects awareness and commitment in diabetes self-management*”, reflects two sub-themes, namely, “Writing creates space and time for autonomous reflection” and “Writing influences individuals’ focus in diabetes self-management”. Patients suggested that by creating space and time to express thoughts and feelings, writing affords an opportunity for reflection on what is important to them in diabetes self-management. With reflection, participants came to discover aspects of themselves and their reactions to situations of which they had not been aware previously. They considered written reflection to be a useful clinical tool (in addition to traditional health care) because the reflection sheets focused on psychosocial aspects of having and managing diabetes. Writing also creates transparency and concretizes ideas, which influences focus in diabetes self-management and a positive commitment to goal-setting.

The second theme, “*Written reflection is perceived as inapplicable in diabetes self-management*” reflects two sub-themes, namely, “Responding in writing is difficult” and “The timing of the writing is inappropriate”. Some participants mentioned they struggled with writing in general, whereas others suggested that the writing would have been easier if the reflection sheets were in a paper format rather than digital. Participants found it difficult to comprehend the questions, indicating that the language was “too academic”, and they found some of the reflection sheets to be repetitive. Participants noted the importance of meeting the registered nurse during the intervention. Some participants experienced that the written reflection conflicted with their expectations for a self-management support program. These participants viewed working with the reflection sheets as too time consuming, likely to create unnecessary problems and concerns, and inapplicable to their current life experience.

In summary, we suggest that written reflection in the context of the eGSD can support patients' autonomy and competence, which are conducive to autonomous (i.e., optimal) motivation for diabetes self-management and positive treatment outcomes. Nevertheless, the structured nature of written reflection in the eGSD may be inapplicable for some participants. Therefore, we advocate for further development and examination of the eGSD as a 'blended' approach, especially for those who consider written reflection difficult or unfamiliar.

4.3 Paper III: Adults with type 2 diabetes and registered nurses perceptions of how an eHealth intervention conducted in general practice influence their relationship

The aim of this study was to explore how the eGSD influences the patient-nurse relationship from the perspective of patients participating in the eGSD and the RNs conducting the intervention.

The qualitative content analysis yielded two main themes. The first theme, "*eGSD facilitates reciprocal understanding and flexibility in the relationship*" was interpreted from the patients' and the registered nurses' experiences of the eGSD as facilitating openness in the communication and a more flexible follow-up. The approach allowed patients to communicate with the registered nurse about what was important for them. Several patients talked about how the intervention was useful in getting acquainted; enhancing confidence and understanding, cooperation and trust. However, informants described that it was necessary to schedule appointments with the registered nurse to completing the reflection sheets to avoid postponing the task. For the registered nurses written communication with patients via eHealth had benefits, such as increased understanding of the patients' life situations. Moreover, the registered nurses interpreted that the patients had more

time to think and consider thoroughly what they wanted to share; thus, they had increased control of the information flow. The eGSD appeared to create a flexible follow-up, conducive to a positive patient-nurse relationship. However, the eHealth approach was more convenient for the patients than for the registered nurses. They found it time-consuming, and needed more training to attain a sense of proficiency in written communication with their patients.

The second theme, “‘Calibrating’ the relationship with additional in-person contact in the eGSD” reflected both patients’ and registered nurses perceptions of the importance of meeting face-to-face and their experience that communicating in writing is more vulnerable to misunderstandings. When communicating digitally, both patients and registered nurses lacked the immediate responses required in verbal conversations. However, most patients agreed a combination facilitates an improved relationship. The registered nurses were particularly concerned about misunderstandings, and restricted their counselling replies when communicating in writing. This influenced emotional aspects and the depth of the communication, and thus the patient-nurse relationship. For the registered nurses, the meeting was particularly valuable because communicating in-person confirmed the assumptions and interpretations they had made when communicating in writing, and facilitated the possibility for explaining and summing up.

In summary, as the diverse findings indicate, eGSD may function as a facilitator for the relationship for *some* participants (both registered nurses and patients), whereas others may benefit from a more traditional approach. The barriers regarding the patient-nurse relationship must be acknowledged when developing eHealth interventions. It seems integral to educate health care professionals for the future health care services. Thus, health educational institutions and institutions delivering health care should prioritized plans, frameworks, and education on how health

Summary of the results

care professionals can form relationships with patients through written communication via eHealth.

5 Discussion

The overall purpose of this thesis is to provide insight into how adults with type 2 diabetes and registered nurses experience the eGSD conducted in general practice, and how the eGSD may influence motivation for diabetes self-management and intervention participation. The following section discusses the main findings of the three studies firstly regarding the eGSD's influence on motivation for diabetes self-management, secondly regarding the eGSD's (including written electronic reflection and communication) influence on motivation for intervention participation. Lastly, a thorough methodological discussion is presented.

5.1 The influence of eGSD on motivation for diabetes self-management

The findings in papers II and III concern patients' diverse experiences with the eGSD, including positive consequences of conducting reflections based on the reflection sheets related to motivation for diabetes self-management as well as positive consequences of electronic communication on the patient-nurse relationship. Some components of the eGSD might stimulate motivation by supporting a sense of autonomy and competence for some patients (paper II). Moreover, the findings suggest that reflection sheets and written communication that enable patients to share personal experiences with the registered nurse could have a positive influence on the patient-nurse relationship (paper III). In diabetes self-management support, it is integral to consider each individual's unique experience of living with diabetes, as this enables collaboration and providing appropriate advice and support (Phillips, 2016). When patients are able to share psychosocial aspects of their lives and self-management of type 2 diabetes, they may experience understanding from their registered nurse. Understanding and trust are

important components of the basic psychological need of relatedness (Ryan et al., 2008).

Together, the findings in paper II and III may reflect that components of the eGSD have the potential to support the basic psychological needs of autonomy, competence and relatedness for some patients. Interpreted through the lens of self-determination theory this may in turn support internalization of regulation and autonomous motivation for the often-demanding diabetes self-management behaviors over time, and may consequently lead to improved treatment outcomes (Ryan et al., 2008). Recent research suggest focusing on and supporting autonomous motivation is one of the most important factors in interventions for people with type 2 diabetes (Juul, Rowlands, & Maindal, 2018). This may advocate for the use of eGSD as a self-management support intervention for this patient group in general practices.

However, the findings revealed that patients do not value or benefit from the eGSD in a uniform way. All three papers indicate that certain aspects of the eGSD are experienced as irrelevant or inapplicable for some participants. The diverse findings build on a study published based on the development phase of this project, arguing that even though some participants valued the counselling, others experienced it as irrelevant (Karlsen et al., 2018). These findings from the current pilot study reflect that it is important to modify the reflection sheets and additionally allow patients to choose which ones they want to focus on and which ones they want to omit, to support autonomy for all participants.

The findings of all three papers indicate individual difference in how patients prefer to receive health care and support from the registered nurses. It is important to consider these individual differences when developing eHealth self-management support interventions aimed at stimulating motivation for diabetes self-management. Our findings may serve as a reminder of the complexity of developing and conducting

complex interventions in clinical practice. The phrase “one size does not fit all” applies to the eGSD. Correspondingly, no other single self-management support intervention will be suitable to meet the needs of all patients at all points in time (Barlow et al., 2002). Our findings, which indicate both benefits and drawbacks of the eGSD, advocate for health care professionals to deliberately choose appropriate approaches for each individual patient. To achieve the potential benefits of eHealth interventions, such as the eGSD, on motivation for diabetes self-management, it seems integral to find methods to identify and include patients who see the value of and therefore are motivated for and may benefit from such interventions, and provide other patients follow-up as ordinary. Thus, the eGSD intervention needs to be targeted at patients that would benefit from the intervention the most. Providing appropriate inclusion criteria for recruiting participants to the eGSD intervention may therefore be of importance.

5.2 The influence of eGSD (including written reflection and communication) on motivation for intervention participation

The findings in papers I and II indicate that some patients found the reflection sheets difficult to understand. This may lead to a reduced sense of competence when engaging in the intervention. Health literacy is increasingly addressed in the literature, indicating some people have problems understanding or using the health information they receive (Friis, Vind, Simmons, & Maindal, 2016; Juul et al., 2018; Lundetræ & Gabrielsen, 2016). Our findings concerning difficulties with understanding the reflection sheet could therefore act as a reminder for researchers and health care professionals to become more conscious about the words and concepts they employ when developing eHealth interventions for people with type 2 diabetes. When the reflections and counselling responses from the registered nurse are delivered in writing,

there is also a smaller possibility for the registered nurses to provide patients with assistance to understand the purpose of each reflection sheet or to make sense of the prompted reflections. Thus, the reflection sheets might require further adaption for adults with type 2 diabetes in the eGSD, in terms of the language as well as the number of reflection sheets.

Interpreted through the lens of self-determination theory, communicating asynchronously in writing may appear to result in a decreased sense of relatedness for *some* patients, i.e., less experience of support from and connection with the nurse. All patients involved in the eGSD underlined the importance of in-person meetings (papers I, II and III). These findings build on evidence from earlier research, suggesting that the value of eHealth for patients with type 2 diabetes may be limited if it does not include in-person meetings; therefore, including human contact in eHealth interventions may secure their effectiveness (King et al., 2012). Even though communicating and working towards a mutual understanding and collaboration is an important part of the intervention, it appears the ‘pure’ eGSD did not facilitate this potential. Therefore, in-person consultations with the registered nurse may be necessary to realize the full potential benefits of the eGSD, and written asynchronous communication should ideally complement rather than replace in-person contact.

It seems important to acknowledge that communicating in writing is profoundly different from communicating verbally. Digital asynchronous communication can in some ways be compared to traditional letter writing, with a time-delay and possibility to refine the message through editing. This may provide benefits for some patients, as findings in papers II and III indicate. Some people communicate their thoughts and feelings more easily in writing compared with oral conversations. Consequently they share more in writing (Kraus, Stricker, & Speyer, 2011), as our findings also indicate. Moreover, when writing

reflections electronically, the patients can keep them private until they choose to send them and share them with their nurse. When sending the eGSD reflections electronically without having to say them aloud and without verbal and physical cues, the patient-nurse relationship may develop without the ‘scenes’ of self-presentation that would be present in a face-to-face consultation at the general practice. For some people and in some situations, this could be beneficial and support their sense of autonomy and relatedness, as mentioned earlier. However, asynchronous communication has both benefits and drawbacks.

The findings in paper II and III indicate that the secure messaging in the eGSD significantly changes the patient-nurse communication. The first point I would like to address is that the idea behind developing a counselling-intervention via asynchronous secure messaging was that the web-page should function primarily as a medium for communication. We anticipated that the eHealth approach would increase interest in and reach of the intervention. We also anticipated that patients and registered nurses would value the ability to access secure messages whenever convenient as an efficient method. This builds on a recently published study, which suggests that adults’ with type 2 diabetes prefer digital interventions that are available at all times (Pal et al., 2018). Moreover, when initiating the eGSD we anticipated the duration of the intervention would be shorter compared to the original GSD because of the flexibility provided by electronic communicating. The ‘pure’ eGSD was therefore commenced with no deadlines for the patients, allowing them to decide for themselves when to engage in the intervention. However, the findings indicate that this flexibility might have reduced the sense of commitment, as it resulted in a prolonged duration of the intervention for some of the participants. Our findings indicate that patients, in contrast to our expectations, valued and benefitted from having a “due-date” to return the reflection sheets to their nurses (paper III). As we modified the eGSD for the second half of the participants in this project and included an in-person meeting after the third eConsultation, we were able to

explore experiences with both versions. By adding an in-person meeting following the third eConsultation, the duration of the intervention was profoundly reduced. More importantly, both patients and registered nurses seemed to prefer this approach to the eGSD. This underlines, as earlier mentioned, that an additional in-person meeting is necessary to achieve the full potential of the GSD as an eHealth intervention.

The second point I would like to address is the finding from paper III, indicating the registered nurses restricted their written replies to the patients' reflections because they did not know how the written messages would be received. Written patient-nurse communication is still a novel feature. All the participants in this study, both patients and registered nurses, were unfamiliar with patient-nurse communication by means of technology. Communicating asynchronously in writing decreases richness of communication due to the absence of social cues, such as body language. Even though this has positive potentials as discussed earlier, it could also possibly lead to misunderstandings and misinterpretations and thus influence the patient-nurse interaction negatively. The registered nurses did to a larger degree than the patients state that the in-person meeting was integral for the relationship. A possible interpretation of this finding may be that in-person meetings are experienced as important to instigate and maintain the patient-nurse relationship. The registered nurses found that meeting the patients during the intervention was integral for discussing or explaining issues in real time. The nurses valued getting a chance to respond to the patients' reflections in person, to see their reactions and offer explanations or adaptations based on each individual's need. The findings add to previous research pointing out 'the art and science' of traditional face-to-face interaction and consultations between health care professionals and patients is profoundly changed when communication and information flow are mediated by electronic tools, such as eHealth services (Weiner, 2012). This underlines potential disadvantages of communicating in writing in the eGSD.

The registered nurses are professionals; therefore, they (legitimately) feel obligated to make sure the patients understand their messages correctly. They found this easier to do in familiar in-person meetings. This finding may be linked to earlier research, which has suggested that health care professionals are more critical in their reflections concerning eHealth services compared to the patients (Odnoletkova et al., 2016). As health care professionals are the ‘gate-keepers’ in eHealth interventions (by recruiting patients, talking up or -down the interventions and finally conducting the interventions), this is an important aspect to consider when developing and piloting eHealth interventions. Health care professionals’ beliefs that eHealth interventions are useful have been addressed as integral for eHealth implementation (Varsi, Ekstedt, Gammon, & Ruland, 2015). Therefore, stakeholders, developers, and researchers need to take measures to clarify the value and benefits of eHealth interventions, to improve health care professionals’ motivation to use eHealth.

Supporting health care professionals’ autonomous motivation to use eHealth tools by supporting their sense of competence in written patient-nurse communication, for example, may seem of great value for uptake and use of eHealth in the health care services. Many registered nurses currently practicing in hospitals and primary health care were educated prior to the entry of eHealth services, underlining the importance of appropriate training. Health care professionals may disengage from eHealth services if they feel they lack competence. Thus, institutions educating health care professionals and delivering health care should provide their students and employees training to be able to master written digital communicating and form relationship with patients with such approaches. If health care professionals, such as registered nurses, experience a sense of competence when engaging in eHealth interventions, they are more likely to be motivated to continue their engagement, and they may also see the value of the approach as proposed by the self-determination theory (Ryan & Deci, 2000). Instead of

assuming that registered nurses have the proficiency or confidence in digital written communication, it seems integral to provide thorough training for health care professionals in digital communicating with patients in writing. This applies to professional education programs in higher education as well as training initiatives for employees in the health care services. In addition, as eHealth services are increasingly implemented, stakeholders and developers of eHealth containing written communication should contribute to the development of guidelines and frameworks to secure quality of such communication.

5.3 *Methodological discussion*

In this chapter, I present and discuss important methodological reflections as well as strengths and limitations of this pilot project and this thesis.

5.3.1 *Developing and piloting a complex intervention*

5.3.1.1 *Evolution of the research project*

This PhD project thoroughly piloted a complex intervention. The project started out with an interest and an aim to explore how the GSD self-management support intervention administered as an eHealth intervention in general practices could improve adults' with type 2 diabetes motivation for diabetes self-management (Karlsen et al., 2016). During the course of the intervention, it became evident that due to among other things the large dropout rate, it would be of considerable value to explore *all* patients as well as registered nurses experiences with the piloted eGSD to identify experiences with the eGSD from several perspectives. Knowledge gained from such exploration is valuable as it provides insight into the ways in which an intervention functions in a real-life context (Sandelowski, 1996). The current pilot study has shown that developing and piloting a complex intervention in general practices

can be a lengthy and sometimes strenuous process. All of the stages in the process are equally important; thus, adequate development and piloting work are vital to develop effective interventions before evaluating or implementing them (Craig et al., 2008). The empirical findings and the process of the piloted intervention influenced and changed the focus of this project and the studies included in this thesis. I argue this indicates the project has followed the MRC methods framework and the purpose of piloting complex interventions.

5.3.1.2 User-involvement in the process of developing the complex intervention

As mentioned in the methods section, a resource group and user-participants were involved in the development of the eGSD. Earlier research has addressed that involving patients and stakeholders in developing interventions may help ensure the quality, feasibility and relevance of interventions for the people they aim to benefit (Andrews, Allen, Sheppard, Baylis, & Wainwright, 2015). Throughout the entire development and piloting process, we organised meetings with the resource group where we presented the project, the intervention, and the web-solution and asked for their advice and comments, concerning e.g., the reflection sheets and the technical solution. The resource group was asked to comment and respond to the solutions presented to them. Thus, relating this approach to the model of user-involvement by Tritter et al (2009), the user-involvement in this research project might have been in a collective, indirect and reactive manner, compared to an individual, direct and proactive (Tritter, 2009). It is difficult to determine the influence of the user-involvement on this study and its findings, something that has also been addressed in earlier research (Boote, Telford, & Cooper, 2002). However, our findings indicate that it might be difficult to recommend the best solutions before trying them out in real life. Moreover, key stakeholders should be engaged to ensure effective intervention development (Andrews et al., 2015). The

stakeholders (i.e., leaders in general practices where the intervention was conducted) were not included in the resource group. This could be a limitation of the user-involvement in the development process and piloting of the eGSD. This could be addressed by future eHealth interventions conducted in general practices.

5.3.1.3 Reflections on the large dropout rate and the relevance of the findings

Findings in all three papers, but in particular paper I, pointed out that changes and improvements of the eGSD seem necessary for people to remain motivated for and remain engaged in the intervention. Even though the dropout from the eGSD was much higher than the 20% dropout rate commonly expected in clinical interventions (Melnyk & Fineout-Overholt, 2015), it is comparable to the dropout rate of other eHealth interventions. Large attrition rates from eHealth have been addressed for many years and identified as unavoidable and something researchers should plan for (Eysenbach, 2005; Wangberg et al., 2008). Earlier research on the GSD for people with type 1 diabetes in Norway has also emphasized large attrition (close to 50%) (Mohn et al., 2017). However, earlier studies have not provided in-depth information about patients' experiences with and reasons for dropout, and thus this thesis adds new knowledge to the GSD and eHealth evidence-base.

Although it is hardly surprising that frustrating technology was amongst reasons why people dropped out of the eGSD, it is a stark reminder that thorough testing with users is crucial. Our findings underline the importance of conducting pilot-studies to reveal factors that may hamper effective interventions in clinical practice (Craig et al., 2008). In the context in which this pilot-study was conducted, people are surrounded with technology and expect technological devices and electronic solutions to function optimally and efficiently. Along with basic functionality problems, patients had to download, complete PDF forms,

and return these as part of the eConsultations. Some patients perceived this as somewhat cumbersome. The frustrating technology threw a ‘spanner in the works’ for the intervention and the progress. Luckily, these challenges were detected in our pilot study before a prospective evaluation or implementation study. Our experience shows that even when choosing an already existing and implemented technological solution (the web-page MinJournal.no), it may cause frustrations for participants. This is important to consider when dealing with the choice of using existing technological solutions or developing new solutions to fit objectives of interventions.

Technology evolves rapidly, and already alternate ways of communicating via eHealth are being developed and implemented in health care, such as videoconferencing and chat-services. Such synchronous digital communication options could perhaps beneficially replace the asynchronous secure messaging used in the eGSD. However, the secure messaging system provided by MinJournal.no was the only implemented system when this project was initiated in 2013. In addition, we wanted to explore asynchronous communication in the eGSD. Nevertheless, this study emphasizes the importance of combining eHealth with regular face-to-face consultations to maintain patients’ motivation for intervention participation.

In an ideal world, we would provide unlimited, frequent contact between patients and health care professionals in a variety of different diabetes self-management support interventions. However, as mentioned in the introduction, the increasing prevalence of people with chronic conditions is one of the major challenges the health care system will face worldwide in the future. This suggest the need for more effective and innovative self-management support interventions for adults with type 2 diabetes. When implemented and used successfully, eHealth could improve the quality of care in terms of increased availability as well as patient safety and security. Efficient eHealth services may consequently contribute to

reduce the expected lack of trained health care professionals in the future Norway (Direktoratet for e-helse, 2017). However, to achieve these benefits and increase efficiency efforts need to be made to develop eHealth interventions that can replace rather than complement existing health care. The findings from this pilot study may add important knowledge for stakeholders, researchers and health care professionals developing eHealth interventions, and inform ways in which they can allocate resources more optimally as eHealth interventions are implemented.

5.3.2 Strengths and limitations

Several strengths and limitations must be considered when assessing the findings and results of this thesis. A qualitative approach when piloting complex interventions in health research makes it possible to describe and interpret human experiences of interventions in a real life setting (Craig et al., 2008). This is of great value, as it illuminates various aspects of the intervention as perceived by participants that might not have been possible to detect otherwise. This can be considered a strength of the current study.

The intervention was conducted at eight general practices in southwestern Norway, all of which had a registered nurse working with follow-up of patients with diabetes. It should be noted that most general practices do not have a registered nurse working specifically with diabetes follow-up. The included general practices may therefore not represent the average general practices in Norway. This limited the potential recruits of registered nurses to this project. The included registered nurses were the ones who agreed based on their own interest or availability. Moreover, the registered nurses recruited a smaller number of patients to the intervention than initially planned. Additionally, as mentioned earlier, there was a large dropout rate of patients. Out of 25 included patients to the pilot study, 15 dropped out.

Specifically, 13 out of 18 participants dropped out of the ‘pure’ eHealth version, and 2 out of 7 dropped out of the ‘blended’ version. Most participants dropped out in the initial stages of the intervention, namely before or during the first eConsultation. The large dropout and the small number of participants may be considered a limitation of the current study.

However, most patients initially included to the intervention participated in the studies included in this thesis. This applies to both the patients who completed the intervention, as well as those who dropped out (with the exception of 3: one from the ‘pure’ eHealth intervention declined participation in interview, and the two who dropped out from the ‘blended’ version were not requested to participate in interviews). Researching experiences with a particular intervention does in itself limit the number of eligible participants (Malterud, Siersma, & Guassora, 2016). Thus, the fact that almost the “entire population” is included in this thesis may be considered a strength. In addition to the patients, registered nurses’ experiences were also assessed in paper III. Including both perspectives may provide both depth and breadth of information about experiences with the intervention and a deeper understanding of the topic, which could also be considered a strength of this thesis. Although the findings are case-specific, they do offer relevant information and could be transferable to similar settings and interventions for people with type 2 diabetes as well as people with other chronic conditions that require self-management.

The author of this thesis conducted all the interviews. As a PhD student, I am a novice in research and in qualitative method. This could be a limitation of the study. However, the fact that one singular person conducted all the interviews could also be considered a strength in that the same person communicated with all participants, which could have improved and built competence and knowledge during the course of the

data-collection, possibly reinforcing the credibility and relevance of the collected data.

Using a theoretically inspired, semi-structured interview guide, I may have favored answers and issues reflecting my theoretical pre-understanding. The research team was aware of this. In the interviews, I focused particularly on asking follow-up questions to the participants' reflections, clarifying their point of view. However, the pre-understanding based on the theoretical background, amongst other variables, may have influenced the focus of the interviews and the subsequent analysis. As this matter is unavoidable, I argue that by illuminating this matter to ensure transparency, its negative potential might diminish.

Semi-structured interviews entail a conversation that allow a researcher to follow-up the issues addressed by the informant, and each interview is unique. I used three different interview guides, one specific interview guide for the patients who completed the intervention, one for the registered nurses, and one for the patients who dropped out (see Appendices 6-8). As the pilot study entailed two versions of the eGSD, the interview guide for the participants who completed the 'blended' version of the eGSD had additional questions concerning their experiences with the in-person meeting following the third eConsultation. The research questions are the target for the content analysis (Krippendorff, 2013). As paper II and III sought to explore experiences with written reflections from all participants who completed, as well as the eGSD's influence on the patient-nurse relationship, it was considered appropriate to use the data from all the interviews, even with the differing interview guides and perspectives.

The author of this thesis did not have any relationship with the patients participating in the interviews. However, they were aware the intervention was part of a Ph.D. project, and it is conceivable that they

may not have expressed some negative opinions of the intervention to spare the investigators feelings. However, as the findings are diverse, this might not be the case. Moreover, as only 10 out of 25 participants initially included completed the intervention, these participants might have been people particularly interested in the intervention. This might have influenced the findings in paper II and III.

The author of this thesis worked closely with the registered nurses during the intervention. This collaboration and my awareness of challenges they experienced may have affected my pre-understanding and thus influenced my approach during the interviews as well as the data analysis. However, the registered nurses were requested to state their honest opinions and experiences; therefore, the findings likely represent their experiences accurately.

6 Conclusions

This thesis provides insight into how adults with type 2 diabetes and registered nurses experience the eGSD conducted in general practice, and how the eGSD may influence motivation for diabetes self-management and intervention participation. The results show a complex picture of experiences with the eGSD. This concluding chapter presents the main conclusions, followed by implications for practice and implications for future research.

The findings presented in this thesis indicate that eGSD in its present form can be described as a ‘double-edged sword’. The eGSD may support autonomous motivation for diabetes self-management for some adults with type 2 diabetes. Moreover, the eGSD is a new ‘tool’ for registered nurses to deliver self-management support, and it may improve the patient-nurse relationship, which may also stimulate patients’ motivation for diabetes self-management. However, as our findings show diverse experiences with the intervention from both patients’ and registered nurses’ perspective, the current eGSD solution demands adjustments related to the content as well as technological solution before evaluation and implementation in general practice would be feasible.

Certain modifications of the reflection sheets are necessary, e.g., simplifying the language and possibly reducing the number of reflection sheets. Moreover, individually allowing participants to choose reflection sheets on which they want to focus on or which they want to omit may be necessary to support autonomy for all participants. As well, determining the target group for the eGSD more specifically may be important. A ‘blended’ version may be necessary to realize the full potential benefit of the eGSD, and written asynchronous communication

should ideally complement rather than replace the in-person contact to maintain motivation for intervention participation.

6.1 Implications for clinical practice

Information from this thesis may inform researchers and health care professionals who are developing and administering eHealth self-management support interventions about potential benefits and drawbacks of such approaches related to motivation for intervention engagement, as well as motivation for diabetes self-management. Based on the findings from the studies in this thesis, some suggestions can be made to change and improve the eGSD, and inform the development of similar eHealth interventions in general practice:

- The reflection sheets and written reflections in the eGSD may be conducive to autonomous motivation for diabetes self-management and positive treatment outcomes, and thus this approach may be a beneficial tool in self-management support for *some* adults with type 2 diabetes.
- The findings of this thesis indicate that the phrase “one size does not fit all” applies to the eGSD. Our findings showed both benefits and disadvantages of the current eHealth intervention, suggesting that health care professionals have to choose approaches appropriate for each individual patient. To achieve the potential benefits of eHealth interventions, it seems necessary to find methods to identify and include patients who are motivated and will benefit from eHealth interventions, such as the eGSD, and follow-up other patients as ordinary.
- One way to improve the eGSD would be to individually adapt the intervention by allowing the patients to choose the reflection

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sheets on which they want to focus or which they want to omit, and thus support autonomy of all patients.

- In-person consultations with the registered diabetes nurse may be necessary to realize the full potential benefit of the GSD as an eHealth intervention. Hence, we advocate for further development and examination of the eGSD as a ‘blended’ approach, especially for those who consider written reflection difficult or unfamiliar.
- A ‘blended’ eGSD may maintain the participants’ motivation for participation, reducing dropout from the intervention.
- Electronic written communication is a novelty in patient-nurse relationships; thus, registered nurses need to acquire new skills. It is important to provide practical training as well as guidelines to secure the quality of written patient-nurse communication. Thus, institutions educating health care professionals and delivering health care need to prioritize such guidelines, as well as plans and frameworks on how to educate health care professionals in written communication with patients via eHealth.
- Ensuring that the patients receive the health care services from which they will most likely benefit is one way of moving forward with the health care system in the future. Giving potential participants tailored information about the objective, the content, and the effort needed to remain engaged in complex eHealth interventions seems imperative to ensure recruitment of eligible participants. In this way, resources may be allocated in a better way.

- Facilitating more user-friendly eHealth technology that would support users' sense of competence and thus help them maintain motivation for continuous intervention engagement is of great priority when developing eHealth interventions.

6.2 Suggestions for further research

This thesis has shed some light on patients' and registered nurses' experiences with the eGSD. However, given the methodological limitations and the small sample recruited to this pilot project, more research is needed to confirm and elaborate on the findings of this study. Some proposals for important future research have been made in the articles and the discussion in this thesis, as summarized below:

- The results indicate additional in-person meetings are necessary in the eGSD. The participants in this study tried a 'pure' eGSD or a 'blended' eGSD, and thus experiences with the two different approaches could be explored. However, three-armed controlled studies or comparative studies is needed to be able to compare versions and draw definite conclusions about differences.
- eHealth seems beneficial for some patients, but not for others. "Whom benefits from eHealth interventions?" seems to be a central question for future research to address. Future research on written reflection and written communication in eHealth should strive to identify the participants who benefit most from eHealth interventions including such aspects.
- Future research on written reflection and eGSD might attempt to strike more of a balance between focusing participants on broad life issues versus specific issues relevant to diabetes self-management.

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- As eHealth and written communication is a novel approach, a large effort and more research is needed to educate health care professionals in these new methods of communicating with patients. A large effort is needed also regarding frameworks for development, functionality, as well as user assistance in eHealth. Securing the quality of written communication is challenging, and this concern is transferable to similar interventions. This needs to be explored further with the implementation of eHealth self-management support interventions.
- In this project, individual interviews were used to collect all data. Before implementation of the eGSD for adults with type 2 diabetes, the intervention needs further improvements, and larger evaluation studies should be designed to assess patients' experiences and the effects of the intervention on various outcomes, such as patient activation, perceived competence for diabetes, health care climate, or the harder outcome measure HbA_{1c}.
- Video-conferencing would more closely imitate regular consultations compared to the asynchronous written messages by allowing direct verbal responses. Including videoconferencing or other eHealth services such as synchronous chat in the eGSD, could improve the intervention. We recognise that communicating via videoconferencing could have drastically changed the way in which both patients and registered nurses perceived this intervention. As secure videoconferencing was not delivered by any stakeholders when we initiated this project, this is an aspect that could be explored in future research.

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Part II

Paper I

Original Paper

Dropout From an eHealth Intervention for Adults With Type 2 Diabetes: A Qualitative Study

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Abstract

Background: Adequate self-management is the cornerstone of type 2 diabetes treatment, as people make the majority of daily treatment measures and health decisions. The increasing prevalence of type 2 diabetes mellitus (T2DM) and the complexity of diabetes self-management demonstrate the need for innovative and effective ways to deliver self-management support. eHealth interventions are promoted worldwide and hold a great potential in future health care for people with chronic diseases such as T2DM. However, many eHealth interventions face high dropout rates. This led to our interest in the experiences of participants who dropped out of an eHealth intervention for adults with T2DM, based on the Guided Self-Determination (GSD) counseling method.

Objective: In this study, we aimed to explore experiences with an eHealth intervention based on GSD in general practice from the perspective of those who dropped out and to understand their reasons for dropping out. To the best of our knowledge, no previous qualitative study has focused on participants who withdrew from an eHealth self-management support intervention for adults with T2DM.

Methods: A qualitative design based on telephone interviews was used to collect data. The sample comprised 12 adults with type 2 diabetes who dropped out of an eHealth intervention. Data were collected in 2016 and subjected to qualitative content analysis.

Results: We identified one overall theme: "Losing motivation for intervention participation." This theme was illustrated by four categories related to the participants' experiences of the eHealth intervention: (1) frustrating technology, (2) perceiving the content as irrelevant and incomprehensible, (3) choosing other activities and perspectives, and (4) lacking face-to-face encounters.

Conclusions: Our findings indicate that the eHealth intervention based on GSD without face-to-face encounters with nurses reduced participants' motivation for engagement in the intervention. To maintain motivation, our study points to the importance of combining eHealth with regular face-to-face consultations. Our study also shows that the perceived benefit of the GSD eHealth intervention intertwined with choosing to focus on other matters in complex daily lives are critical aspects in motivation for such interventions. This indicates the importance of giving potential participants tailored information about the aim, the content, and the effort needed to remain engaged in complex interventions so that eligible participants are recruited. Finally, motivation for engagement in the eHealth intervention was influenced by the technology used in this study. It seems important to facilitate more user-friendly but high-security eHealth technology. Our findings have implications for improving the eHealth intervention and to inform researchers and health care providers who are organizing eHealth interventions focusing on self-management support in order to reduce dropout rates.

KEYWORDS

eHealth; Telehealth; type 2 diabetes; Internet; counseling; qualitative research; general practice, self-management; self-management support; patient dropouts

Introduction

eHealth interventions are promoted worldwide and hold a great potential in future health care for people with chronic diseases such as type 2 diabetes mellitus (T2DM). However, many eHealth interventions face adoption problems and high dropout rates [1-5]. This led to our interest in the experiences of participants who withdrew from an eHealth intervention for adults with T2DM at general practices in Norway.

Diabetes is a chronic disease affecting an estimated 415 million people worldwide. Most of them have T2DM and its prevalence is rapidly increasing [6]. People living with diabetes are recommended to engage in multiple self-care behaviors such as taking medications, following a diet, engaging in regular physical activity, and self-monitoring, in addition to problem-solving and coping [7]. These are all aspects of diabetes self-management and essential to blood glucose control for the prevention of long-term complications. Many people with T2DM find adequate self-management difficult to achieve and maintain [8]. Some of the recommended self-management behaviors do not coincide with peoples' priorities and desire for a "normal life." They may differ from people's habits and preferences and be perceived as burdensome [9,10]. Research indicates that only 1 in 8 patients with T2DM achieves the recommended treatment goals of glycemic control, cholesterol, and blood pressure [11]. Consequently, to achieve adequate self-management and optimal treatment outcomes, many patients need support from a health care professional. Given the increasing prevalence of T2DM, there is a need for innovative and effective ways to deliver self-management support interventions for people with T2DM. eHealth self-management support interventions can assist people with adopting and maintaining behaviors needed for adequate diabetes self-management [12-14].

Secure messaging is an eHealth technology that facilitates personal and interactive communication between health care providers and patients. A systematic review of participatory Web-based interventions found that asynchronous communication tools such as secure messaging was experienced as particularly useful for self-management support [2]. Such communication between patients and health care providers seems to improve effects and adherence in eHealth interventions [15-17]. Moreover, previous research has addressed the need for theory-based eHealth interventions for T2DM [14]. Theory-based interventions are valuable as the theory inform intervention strategies. These strategies translate into key components of the interventions that can be applied and assessed, thus facilitating explanation of observed effects or lack thereof [18,19].

As a response to the need for effective and theory-based interventions for people with T2DM, we adapted the self-management support intervention Guided Self-Determination (GSD) for T2DM [20], as an eHealth intervention via secure messaging in general practices (Table 1 and Textbox 1). GSD is a counseling approach founded on the self-determination theory (SDT). This theory proposes that in order to foster autonomous motivation for engagement in activities, it is important to support individuals' basic psychological needs for autonomy, relatedness, and competence [21]. The GSD intervention aims to support diabetes self-management by empowering self-determined goal-setting and competence-building [22,23]. The intervention is described in more detail in the Methods section.

Some eHealth interventions show dropout rates of up to 80% [3-5]. A systematic review, exploring Web-based interventions designed to support and promote diabetes education and health behavior change for management of T2DM, similarly shows that intervention-engagement and usage declined over time. About half of the interventions focused on support and coping skills, and the most targeted behaviors were physical exercise, diet, and blood glucose self-monitoring [15]. A meta-analysis of the effectiveness of Web-based tools for people with diabetes suggests that participants' difficulties in understanding the use of Web-based interventions led to higher dropout rates [24]. Moreover, a study investigating adherence to a Web-based intervention to support diabetes self-management through components derived from social cognitive theory (such as modeling-videos, information, and tools to monitor own target behavior), indicates that Web-based trials should plan for a 50% dropout rate in the first month of the intervention [25]. In a 2016 study, close to every second patient did not log on more than once to a personal health record with self-management support and personal feedback for patients with T2DM. Only five of 132 participants used the eHealth self-management support program with goal setting and action planning functionality. Three out of these five took advantage of the personal feedback offered by the health psychologist [26].

Dropout and nonuse are thus major challenges in eHealth interventions, including those offering self-management support and personalized feedback. This makes it imperative to explore experiences of such interventions among people who drop out. To the best of our knowledge, no previous study has conducted qualitative interviews with participants who dropped out of an eHealth counseling intervention designed to support self-management for people with T2DM. The aim of this study was therefore to explore experiences with the eHealth intervention based on GSD from the perspectives of those who dropped out and to provide insight into their reasons.

Table 1. Overview of the Guided Self-Determination counseling for adults with type two diabetes and the reflection sheets.

Consultations	Focus	Reflection sheets
The first session at the GP ^a 's office	Preparing for subsequent consultations	Invitation to work together The HbA _{1c} ^b measurement
eConsultation 1	Your life with diabetes	RS ^c 1a. Important events and periods in your life RS 1b. At present, what do you find difficult about living with diabetes? RS 1c. Unfinished sentences – your needs, values, habits and opportunities RS 1d. A picture, metaphor or expression of your life with diabetes
eConsultation 2	Focus for change	RS 2a. Room for diabetes in your life RS 2b. Your plans for changing your way of life
eConsultation 3	Work with changes	RS 3a. Clarification of challenge in your life with diabetes RS 3b. Previous problem-solving: thoughts, feelings, goals, and actions RS 3c. Dynamic problem-solving
eConsultation 4	Changes in daily life	RS 4a. Blood glucose self-monitoring and your reasons for self-monitoring RS 4b. New strategies and long-term plan for change RS 4c. Dynamic judgment of current and future problem solving RS 4d. «Pros and cons»

^aGP: general practitioner.^bHbA_{1c}: glycosylated hemoglobin.^cRS: reflection sheet.**Textbox 1.** The Web portal.

The secure messaging service was provided by the portal MinJournal. The secure messaging system at the portal demands login with electronic identification (BankID), providing the highest level of security (security level 4). Norwegian law requires this for Web-based sensitive information transfer, such as asynchronous communication between patients and health care personnel. This platform is already in use in Norwegian health care.

Methods

Design

We used a qualitative design and collected data by means of individual telephone interviews with participants who withdrew from the GSD eHealth intervention.

Description of the Guided Self-Determination (GSD) eHealth Intervention

General practice was chosen as an applicable intervention site because general practitioners (GPs) and registered nurses working with GPs are primarily responsible for health care for T2DM in Norway. The GSD eHealth intervention was delivered in addition to regular care. Regular care consists of structured annual consultations with a GP and nurse, as well as recommended routine measurement of glycosylated hemoglobin (HbA_{1c}) and consultations with a GP every 3–4 months, or individually adapted [20,27].

The aim of the GSD intervention was to support diabetes self-management. The participants answer questions on reflection sheets, and the themes addressed are then discussed with the nurse [28]. Table 1 shows an overview of the 4 eConsultations and topics of the 13 reflections sheets used in the GSD eHealth intervention for T2DM.

In this study, 4 trained nurses experienced in diabetes care at general practices delivered the GSD eHealth intervention over

12 to 35 weeks from August 2015 to April 2016. To establish a relationship, the nurse and patients initially met face-to-face at the GPs office. The nurse explained the aim of the GSD counseling, how to work with the reflection sheets (Table 1), and how to log on to the Web portal to use the secure messaging system (Textbox 1). All patients received a manual describing how to use the portal, the process of downloading and uploading portable document formats (PDFs) to the secure messages, how to fill out the reflection sheets, and send secure messages. After this initial meeting, the patients and nurses were to conduct 4 eConsultations, each consisting of 2 to 4 message exchanges. The patients were to complete the reflection sheets belonging to each eConsultation at home on their own electronic device, using their own words to express and reflect on their experiences and difficulties with diabetes management in daily life. They also formulated goals and plans for self-management. The reflection sheets were sent to their nurses via secure messages. The purpose of the reflection sheets were to facilitate situational reflection and improve communication to enable autonomous problem-solving, goal setting, and action planning (Table 1) [23]. The nurses responded with written feedback to the participants' reflections.

Recruitment

Overall, 18 people invited by nurses at 4 general practices in southwestern Norway agreed to participate in the GSD eHealth intervention. However, 13 of these 18 eventually left the intervention. The nurses who conducted the intervention invited

the participants who had dropped out to take part in telephone interviews with a researcher. One person declined and 12 agreed.

Data Collection

Data were collected through telephone interviews in the spring of 2016. Telephone interviews are useful for collecting qualitative data and are considered less time- and energy-consuming for participants than face-to-face interviews [29,30]. The first author performed all interviews according to a semistructured interview guide. The main question invited the participants to speak freely and was expressed this way: "What was your experience with the GSD eHealth counseling intervention?" Supplementary questions were asked during the conversation to invite clarification and elaboration. Examples were "When and why did you quit the intervention?" "What were your expectations?" and "How did you experience written communication with your nurse via secure messaging?" The interviews lasted an average of 20 min, were audiotaped, and subsequently transcribed verbatim. In addition, demographic and clinical data were collected by a questionnaire, which the participants completed at the start of the intervention.

Data Analysis

The transcribed interviews were subjected to qualitative content analysis as described by Graneheim and Lundman [31]. All interviews were the unit of analysis and were read by 4 members of the research team at the beginning of the analysis process to attain a comprehensive understanding of the data. Meaning units responding to the aim of the study were identified and shortened but with core content preserved. The condensed meaning units were then labeled with tentative codes, after which categories were created by comparing and grouping codes according to similarities and differences. The categories were interpreted and

abstracted into a main theme. Next, to strengthen the credibility of the analysis, the research team discussed and revised the codes, categories, and main theme several times until consensus was reached.

Ethical Considerations

The Norwegian Regional Committee for Medical and Health Research Ethics (REK west No.2015/60) approved the study. All participants signed a written consent form and were guaranteed anonymity and the right to withdraw from the study at any time.

Results

Description of Participants

Participant characteristics are presented in Table 2. Of the 18 participants with T2DM recruited to the intervention, 14 were men and 4 were women. Of the 13 participants who dropped out, the majority (n=9) dropped out in the initial stage of the GSD eHealth intervention, before or during the first eConsultation. The last 4 participants withdrew during the third eConsultation (see Figure 1). Eleven of the 18 participants had an $HbA_{1c} \leq 7\%$, which is the expected treatment goal. The participants who dropped out from the intervention (n=13) did not differ considerably from those who completed the intervention (n=5). However, some small differences were detected; mean HbA_{1c} were 7.1% for the former and 7.7% for the latter. More men withdrew than women. All participants who regulated their diabetes with diet only withdrew from the intervention. Also, the median duration of diabetes was 9 years for those who dropped out and only 2 years for those who completed the intervention.

Figure 1. Dropout graph.

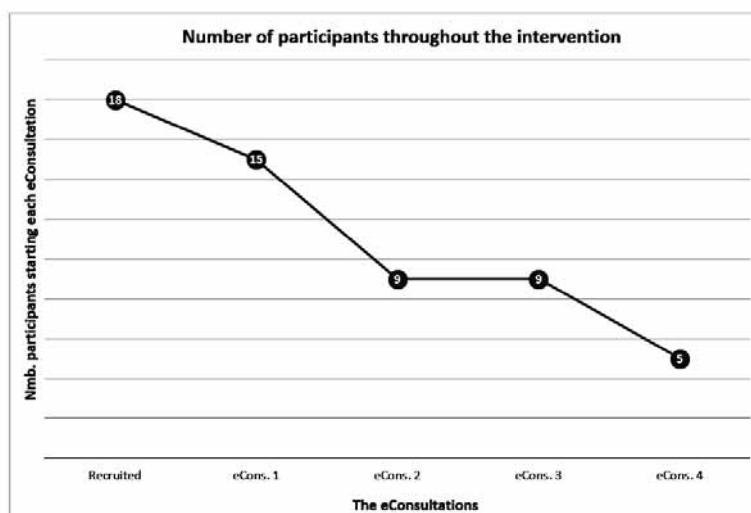


Table 2. Participant characteristics.

Demographics	All 18 participants recruited to the intervention	The 13 ^a participants who dropped out of the intervention
Women (n)	4	2
Men (n)	14	11
Mean age (years, range)	55 (42-73)	57 (44-73)
Mean HbA _{1c} ^b (% , range)	7.3 (5.8-10.0)	7.1 (5.8-10.0)
Median diabetes duration (years, range)	9 (2-15)	9 (2-15)
Living situation (n)		
Alone	4	3
With family	14	10
Educational status (n)		
Higher education >4 years	1	0
Higher education <4 years	6	4
Upper secondary education	8	6
Primary school	3	3
Occupational status (n)		
Working full-time	15	10
Retirement pensioner	2	2
Receiver of disability benefit	1	1
Diabetes treatment (n)		
Diet	4	4
Oral or other medications	11	7
Insulin	3	2

^a12 were interviewed in this study.^bHbA_{1c}: glycosylated hemoglobin.

Overview of Findings

The analysis resulted in identification of one theme related to experiences of the participants who dropped out of the GSD eHealth intervention: losing motivation for intervention participation. This theme described how motivation for participating in the intervention was influenced by some discouraging experiences. It was based on four categories: (1) frustrating technology, (2) perceiving the content as irrelevant and incomprehensible, (3) choosing other activities and perspectives, and (4) lacking face-to-face encounters. These categories are presented below and illustrated with quotations to facilitate transparency of interpretation. The quotations are attributed to the participants [P1-P12] to demonstrate their experiences and opinions.

Frustrating Technology

This category focuses on how participants felt frustrated by the technology used in this eHealth intervention. Initially, participants reported being receptive to participating in the GSD eHealth intervention. They valued the time and resource-saving potential of electronic communication with their nurse. However, they described difficulties in navigating the Web page

due to errors with the portal and perceived the Web solution as time-consuming and tiring:

There was just too much trouble with it (the web page). In the end, I just gave up trying. Had it only been easier... [P12]

Participants stated that it was cumbersome to download and save the PDFs before filling out the reflection sheets. They would have preferred completing the reflection sheets directly on the Web page. Participants also experienced Web page errors, for instance downtime, login problems, alerts from the firewall that it was an insecure Web page (which it was not), or that the nurse had not received the messages they sent. Some described being irritated and frustrated by technological problems. They pointed out that the Web solution bothered them when they were unable to send secure messages:

I answered the questions and tried to send, but it did not send. I tried several times, and I could not do it. This made the whole thing stressful for me...I bothered myself with it because I did not understand it and was not able to send anything. It was a bit silly, but it bothered me a lot, that I didn't get it...I feel like those kinds of things could be manageable, those forms,

sending them. So I don't know what it was with this web page, why it didn't work. [P2]

Although most participants experienced some challenges with the Web solution, some considered the problems minor. They said having to resend undelivered messages and change the browser to access the Web page were acceptable difficulties in an eHealth intervention.

Perceiving the Content as Irrelevant and Incomprehensible

Some participants did not see the content of the GSD as tailored to their needs and expectations for a diabetes self-management intervention. They expressed that they lost interest after reading some of the first issues raised in the reflection sheets because they could not familiarize themselves with these issues and did not consider the content relevant to their diabetes. As one participant noted:

I felt as if some constellations were made that I could not familiarize myself with. I live a completely normal life really; it's just the food, and the blood glucose level that makes me attend to it. But I have managed to adapt to the situation. And I keep adapting more gradually...I felt that it didn't suit me. [P3]

The participants who reached the third eConsultation worked with reflection sheets intended to stimulate people to reflect on their goals and diabetes self-management behaviors. However, the purpose of these reflection sheets was described as difficult to understand:

When I came to "dynamic problem-solving" I started losing interest. I wondered: what do you want here? What method is this? I did not understand the purpose behind the form. [P9]

Moreover, some of the participants stated that they did not fully understand what the intervention entailed when they signed up for it. Three of them said that they would prefer being able to send messages in free text to their nurse on their own schedule, instead of participating in a structured counseling intervention.

Choosing Other Activities and Perspectives

This category concerns the participants' narratives of more important priorities in their lives than the GSD eHealth intervention. Examples were other illnesses that needed more attention and other personal or work-related responsibilities. Daily life consisted of many complex tasks and commitments:

I am quite busy. I work full time and I really like to read. I have so much reading material, and I am active in politics as well. I have so much to read, so that just going online and having to spend much time there...It took too much of my time. Therefore, I felt it was a bit like...I didn't like that so much. I felt it took too much time. [P11]

Going on the Web and engaging in the GSD eHealth intervention seemed to be considered less important than other matters requiring their attention, and the participants therefore chose to minimize their engagement with it:

It was the required time that did it. Some of the questions also, but that was not the main reason. It was more that it became a bit too much on top of everything else, having to sit down and spend time there, and remember to send and, yeah...There was too much else that had to be paramount somehow. Therefore, I simply had to downgrade it. [P5]

Choosing not to focus on diabetes was also mentioned. Being uncomfortable with the issues raised in the reflection sheets or feeling pathologized by the demanding questions were articulated. Wanting to focus on living their life illustrates this perspective:

Because I feel healthy, and I do not want to be sick. But I am sick. Therefore I do have to look after it in the long run. But there is something in my head that I can't seem to get right...I have a diagnosis, but I do not run around being sick. I can explain some of this. My diet is what is wrong, or my life situation towards it (the diabetes). But I want to live as well. There is a limit there somewhere [P9]

Lacking Face-to-Face Encounters

This category concerns the experience of lack of dialogue and a preference for face-to-face encounters with their nurse:

I would miss sitting down, see each other, and talk to each other. Because I'm not so into all the electronic communication. I really like to sit down and see the person I'm talking to. [P4]

Meeting the nurse in person was emphasized as a motivating experience. One participant felt more obligated to try to reduce HbA_{1c}, for example, when communicating with the nurse in person. Participants also stated that answering questions verbally was easier than writing down the answers, and that they would rather speak with the nurse in their regular consultations with the nurse. The following quotation illustrates this preference:

I think it is a lot better to sit and talk with her (the nurse) right in front of me. You know, and then we can discuss things and talk a little bit like that...And if there is any misunderstanding we can ask when we're sitting right next to each other. [P8]

In addition, having eConsultations without a scheduled appointment with the nurse was considered less binding than regular health consultations:

It was allocating the time to it I had problems with...Although committing to answer, it does not have the same "disciplining" effect that one gets by meeting up at the doctor's office. [P5]

At the same time, some participants emphasized that written messages could improve communication with the nurse by enabling carefully considered answers. They valued the ability to read and reflect upon the questions before answering:

The information you are able to provide about your health condition is much more thorough and better over the internet, when you sit and think through what you are going to answer and how to answer and that kind of thing. Than meeting up at the GPs office. [P12]

Some of the participants insisted that they were accustomed to electronic and written communication. They appreciated the potential benefits of digital communication in health care, and some of them even preferred it, given they had the need for it. They mentioned that asynchronous digital communication could be time- and resource-saving. A combination of eHealth and regular encounters with the nurse was suggested as preferable when conducting the GSD, compared with merely written communication via secure messages.

Discussion

Principal Findings

This study provides insight into experiences with an eHealth intervention based on GSD from the perspective of those who dropped out and into their reasons for dropping out. Our findings indicate that the GSD eHealth intervention without face-to-face encounters influenced the participants' motivation for the intervention negatively and resulted in dropout. Other factors that diminished their motivation pertained to choosing other activities and perspectives in their lives, perceiving the content as irrelevant, and the technology as frustrating. We discuss these findings considering earlier research and in relation to the dimensions of autonomy, relatedness, and competence proposed by the SDT as important to develop and maintain autonomous motivation.

Comparison With Prior Work

Interventions With or Without Face-to-Face Encounters

Our findings indicate that participants missed face-to-face encounters with the nurse when communicating asynchronously via secure messages in the GSD eHealth intervention. They stated that they found it easier to discuss a variety of issues with the nurse and avoid misunderstandings when meeting face-to-face. Secure messages may have advantages for patient-nurse communication, such as efficient communication at convenient points of time in addition to the ability to think about the message before replying. However, our findings show the importance of acknowledging the drawbacks of written communication, such as the lack of nonverbal communication and the inability to ask immediate follow-up questions. Earlier research has demonstrated that support provided by clinicians via email enhanced adherence in eHealth interventions [32]. In contrast, our findings suggest that written communication alone is not experienced as motivating enough and that additional face-to-face encounters would have been preferred.

This could relate to the SDT, which proposes that a sense of relatedness is essential for motivation [21,33]. If people feel connected to their nurse in a warm, positive, and interpersonal manner, they may become more autonomously motivated to engage in health-related activities such as the GSD eHealth intervention [34]. Written communication via secure messages may not have been conducive to this sense of relatedness. Furthermore, we propose that our findings have some bearing on a previous study that suggests that the people with T2DM who presumably benefit the most from eHealth facilities actually use it the least [35]. This study furthermore suggests that patients' motivation to improve T2DM self-management is not

sufficiently supported by eHealth facilities. This might have been the case for some of our participants. Combining eHealth with regular consultations has been suggested by earlier research as a promising way to improve engagement and reduce attrition [26]. Some of our participants also suggested that this would improve the GSD eHealth solution.

Moreover, our findings suggest that the current eHealth intervention was seen as less important when the participants had to engage in it on their own time and had no standing appointment with the nurse. This could reflect that asynchronous Web-based health consultations are regarded as less obligatory than regular health consultations with a scheduled appointment. This adds to findings from a recent study suggesting that planning for human support and interaction could be essential to upkeep motivation and use of digital interventions [36]. eHealth combined with regular consultations may be an important topic in future research, to facilitate the personal relationship between the participants and the health care personnel needed to motivate those who truly need and could benefit from self-management support interventions.

Lack of Perceived Value of the Intervention

Our findings indicate that participants had commitments that required more attention than diabetes and the GSD eHealth intervention. This was illustrated by narratives of other illnesses or daily responsibilities and competing life demands that required focus and reduced their motivation for participation. According to the SDT, the value people place on various activities affects their motivation [33]. Autonomous motivation is supported if people identify with behaviors or tasks, or place a value on projected results of behaviors [34]. If engaging in an eHealth intervention is not perceived valuable, people will not prioritize it. This intertwines our findings that when participants perceived the content irrelevant to their needs and expectations, the intervention was not perceived as valuable as other matters. Our findings relate to a previous investigation withdrawal from a telehealth intervention, revealing that the most frequent reason for withdrawal was that the participants did not perceive any benefit in using the telehealth service (eg, submitting their blood glucose readings to staff in local monitoring centers) [37]. One explanation for the lack of perceived value of the intervention is that some participants in our study said they already controlled their diabetes well, that they did not consider themselves as sick, or did not want to focus too much on diabetes in their daily lives. More than half of the participants had acceptable levels of HbA_{1c} prior to start, reaching the expected treatment goal of $\leq 7\%$. This could explain why they did not perceive a need for the intervention. Another explanation could be that even though their nurse deemed them suitable candidates for the intervention, they themselves did not want to put diabetes "up front." They were uncomfortable with, or regarded the issues raised in the reflection sheets as too demanding. Others preferred to focus on living their lives, not on the diabetes.

Patients' perspective of "wellness-in-the foreground" has been addressed in the shifting perspectives model, describing that people with chronic illness varies their attention of their disease [38]. Complex lives and competing priorities are important factors for developers to consider when designing "real-world"

eHealth interventions for diabetes self-management support, to create successful engagement strategies and approaches that are likely to reach and engage the target population.

Some participants did not see the relevance of the structured reflection sheets in the GSD eHealth intervention as relevant to them. This matter relates to the discussion of the consequences for motivation when an activity is not perceived as valuable enough and could indicate that the current intervention, with its complex aspects and delivery method, is not suitable for all participants. These findings can have two possible explanations. First, the reflection sheets address aspects of people's lives and emotions which may differ from what the participants are accustomed to and what they expect from communication with their nurse. The patients are asked to reflect on their challenges and make a plan for ideal problem solving (Table 1), which may differ from the traditional health care for people with diabetes, which are more concerned with education and information [7]. As the approach differs, it seems important to provide potential participants tailored information about the aim, the content, and the effort needed to remain engaged in the GSD intervention in order to recruit eligible participants who want to take part in and value such an intervention. Second, filling out reflection sheets electronically and communicating in writing could affect participants' perception of the purpose and value of the questions. The intervention aims to support each individual's autonomous goal setting and action planning [23], which are key features in self-management support interventions for people with diabetes. However, it was designed for face-to-face meetings. Perhaps the issues raised in the reflection sheets are so complicated that some participants would benefit from verbal explanation and discussion.

Technology

Previous research addresses technical problems as a continuous challenge in eHealth interventions resulting in high dropout rates [17,39]. Intelligible and user-friendly technology is imperative to maintain engagement and achieve benefits from digital health interventions [40]. Our findings concerning frustrating technology may therefore not be surprising. However, it is still important to address this issue, as most of our participants described difficulty with the technological solution. This finding may reflect that the demand for security level 4 (see Textbox 1) on patient-provider communication solutions is a barrier to engagement in such interventions. In addition, conducting the intervention depended on participants being able to download and upload PDFs to secure messages, which many participants found cumbersome. Our findings thus indicate that the eHealth technology offered in this study was not sufficiently user-friendly. Earlier research exploring patients' experiences with a diabetes self-management portal reveals technical challenges such as slow Internet access and time-consuming and difficult data entry as barriers to use. Improving the convenience of Web portals seems important to improve usability and reduce attrition [41]. Our findings add to this evidence, indicating that there is still a large potential for improvement in eHealth product design to ensure technology that patients will engage in and use. The frustrating technology may have thwarted the participants' sense of competence in managing the Web solution, and thus, reduced their engagement

with the intervention. This points to the importance of facilitating more user-friendly but high security-level eHealth technology that would support users' sense of competence in managing the solution, and thus, increase their autonomous motivation for intervention engagement. However, experiencing a sense of competence supports autonomous motivation only when accompanied by self-determination [42]. This underlines the importance of creating successful engagement strategies and developing approaches that are likely to reach and engage the target population that can identify with or place a value on the projected results of engagement in the intervention.

Strengths and Limitations

The findings from this study may serve as a basis for future research aimed at broadening our understanding of the dynamics of withdrawing from eHealth interventions. However, generalizations from this small and situational study are not possible, nor are they intended. Out of 13 participants who dropped out of the intervention, 12 agreed to be interviewed. Although this could be considered a small sample, it is a strength of this study that most of the participants who dropped out were willing to be interviewed. The semistructured interview guide allowed the participants to express their genuine experiences, providing rich data. As the interviewer had no relationship with the participants, the participants might have felt more comfortable being candid. However, we cannot rule out the possibility that the nuances of face-to-face interaction are lost so that misleading information may not be detected [30]. Moreover, to reinforce the credibility of the data collection, the same researcher conducted all interviews. The findings and interpretations were discussed by a group of researchers, which also reinforced the credibility of the analysis.

A limitation that should be mentioned was the uneven gender distribution of the participants in this study. Initially, 14 men and 4 women were included, of which only 10 men and 2 women were interviewed. In relative terms, more men than women withdrew from the intervention. eHealth interventions may be used and experienced differently by men and women. A systematic literature review argues that there are gender differences in needs, preferences, and Web-based communication styles when engaging in Web-based health communication [43]. The dropout rate and the results of this study might have been different had we been able to include more women in the intervention. However, as this is a small sample, these are only speculations, and we cannot draw any definitive conclusions. Another limitation was interviewing only participants. Data from the study nurses about their experiences of conducting the intervention and their explanations concerning why patients left the intervention could have introduced other perspectives and improved our understanding of why some participants withdrew from the intervention.

Conclusions

Our findings indicate that the eHealth intervention based on GSD without face-to-face encounters with nurses reduced participants' motivation for engagement in the intervention. To maintain motivation, our study points to the importance of combining eHealth with regular face-to-face consultations. Our study also shows that the perceived benefit of the GSD eHealth

intervention intertwined with choosing to focus on other matters in complex daily lives are critical aspects in motivation for such interventions. This indicates the importance of giving potential participants tailored information about the aim, the content, and the effort needed to remain engaged in complex intervention so that eligible participants are recruited. Finally, motivation for engagement in the eHealth intervention was influenced by the

technology used in this study. It seems important to facilitate more user-friendly but high-security eHealth technology. Our findings have implications for improving the eHealth intervention and to inform researchers and health care providers who are organizing eHealth interventions focusing on self-management support, in order to reduce dropout rates.

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Authors' Contributions

SSL, BK, MG, and BO developed the study design. ERO contributed to the recruitment of participants and data collection. SSL performed the data collection, transcription, the tentative data analysis, and drafted the first version of the manuscript. BK, MG, and BO contributed to the data analysis. All authors contributed in editing the manuscript, and all authors contributed and agreed to the final draft of the article.

Conflicts of Interest

None declared.

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Abbreviations

GPs: general practitioners
GSD: Guided Self-Determination
HbA1c: glycosylated hemoglobin
PDF: portable document format
SDT: self-determination theory
T2DM: type 2 diabetes mellitus

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Paper II

Written reflection in an eHealth intervention for adults with type 2 diabetes mellitus: a qualitative study

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Background: Individuals with type 2 diabetes mellitus (T2DM) are responsible for the daily decisions and actions necessary to manage their disease, which makes self-management the cornerstone of diabetes care. Many patients do not reach recommended treatment goals, and thus it is important to develop and evaluate innovative interventions that facilitate optimal motivation for adequate self-management of T2DM.

Objective: The aim of the current study was to explore how adults with T2DM experience using reflection sheets to stimulate written reflection in the context of the Guided Self-Determination (GSD) eHealth intervention and how written reflection might affect their motivation for self-management of T2DM.

Methods: We used a qualitative design in which data were collected through individual interviews. The sample consisted of 10 patients who completed the GSD eHealth intervention, and data were analyzed using qualitative content analysis.

Results: The qualitative content analysis yielded 2 main themes. We labeled the first theme as “Written reflection affects awareness and commitment in diabetes self-management”, which reflects 2 subthemes, namely, “Writing creates space and time for autonomous reflection” and “Writing influences individuals’ focus in diabetes self-management”. We labeled the second theme as “Written reflection is perceived as inapplicable in diabetes self-management”, which reflects 2 subthemes, namely, “Responding in writing is difficult” and “The timing of the writing is inappropriate”.

Conclusion: Our findings indicate that written reflection in the context of the GSD eHealth intervention may be conducive to motivation for diabetes self-management for some patients. However, it seems that in-person consultation with the diabetes nurse may be necessary to achieve the full potential benefit of the GSD as an eHealth intervention. We advocate further development and examination of the GSD as a “blended” approach, especially for those who consider written reflection to be difficult or unfamiliar.

Keywords: eHealth, guided self-determination, self-determination theory, self-management, type 2 diabetes mellitus, written reflection

Introduction

Type 2 diabetes mellitus (T2DM) is a chronic health condition whose worldwide prevalence has increased rapidly in recent decades.¹ Individuals with T2DM are responsible for the daily decisions and actions necessary to manage their disease, which makes self-management the cornerstone of diabetes care.² Self-management can be defined as an “individual’s ability to manage the symptoms, treatment, physical and psychosocial consequences and life style changes inherent in living with a chronic condition”.³

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Adequate self-management of T2DM is therefore a complex process that requires motivation for managing medication as well as lifestyle changes in diet and physical activity to reach treatment goals for glycosylated hemoglobin (HbA_{1c}), cholesterol, and blood pressure in order to prevent serious long-term complications.^{4,5} Indeed, long-term complications associated with T2DM include cardiovascular disease, neuropathy, nephropathy, and periodontal disease, among others.^{1,5} Patients have described adequate self-management of T2DM as difficult to attain because of the following reasons: cumbersomeness of lifestyle changes in diet and physical activity, and the long-term complications of T2DM and other chronic conditions.⁶ Moreover, the values that people hold can conflict with the recommended behaviors for adequate self-management of T2DM, which can undermine the motivation for lifestyle changes.⁷ Hence, it is important to develop and evaluate innovative interventions that facilitate optimal motivation for adequate self-management of T2DM.

Indeed, eHealth interventions have been shown to have potential to support adequate self-management of T2DM, and recommendations suggest that eHealth interventions be theory-based and include “soft-touch” strategies such as personal feedback to enhance efficiency and engagement.^{8–11} Such features enable asynchronous and flexible follow-up for each patient, which can bridge the gap between diabetes care and adequate self-management. Based on these recommendations, in the development phase of our project, we adapted the Guided Self-Determination (GSD) self-management support program to be an eHealth intervention for adults with T2DM.¹² Originally, the GSD program was developed for type 1 diabetes, and research indicates that the program is effective in facilitating the development of life skills and lowering psychosocial distress.^{13–20}

Based on self-determination theory (SDT), the GSD program is intended to enhance autonomous problem solving, goal setting, and action planning among individuals with diabetes.²¹ SDT is an organismic approach to human motivation, which has been applied to health care and health behavior change, including management of T2DM. Central to SDT is the specification of 3 basic psychological needs, namely, autonomy (an experience of volition and choicefulness), competence (an experience of capability and mastery), and relatedness (an experience of support from and connection with important others); the satisfaction of these needs is necessary for optimal motivation, physical health, social integration, and psychological wellness.^{22–24} Indeed, past research has shown that support for the basic psychological needs is associated with higher levels of autonomous motivation for diabetes self-management,

medication adherence, quality of life, dietary self-care, and glucose control.^{4,22,25–28}

An important feature of the GSD program is the use of semistructured reflection sheets, which are designed to afford patients an opportunity to express their experiences and personal difficulties with diabetes, as well as to enable them to participate actively in their care process.¹³ Such expression and active participation can empower patients to become self-determined and develop the skills necessary for adequate self-management of diabetes.¹² Written reflection requires the translation of emotions and experiences into words, and this cognitive process can benefit individuals in a variety of situations.²⁹ The use of writing as a therapeutic approach has been examined in a variety of populations, including college students who are vulnerable to depression, cancer survivors, and individuals with chronic pain and various physical diseases, and findings indicate that this approach can improve treatment outcomes and quality of life.^{30–33} In addition, a systematic review of interventions for women with breast cancer found that expressive writing can improve their physical health.³⁴ To our knowledge, written reflection has not been examined in the context of eHealth interventions, and the current study was designed to fill this gap in the literature.

The study Aim

The aim of the current study was to explore how adults with T2DM experience using reflection sheets to stimulate written reflection in the context of the GSD eHealth intervention, and how written reflection might affect their motivation for self-management of T2DM.

Design

The current study, which was conducted as a pilot study, is part of a larger project that developed a complex eHealth intervention for adults with T2DM who are treated in general practices in Norway.¹² We used a qualitative design in which data were collected through individual interviews that were conducted between December 2015 and December 2016. Interviews provide valuable information on patients’ experiences and opinions, which is important when piloting clinical interventions in real-life contexts.³⁵

Description of the GSD eHealth intervention

Nurses who were trained in the GSD method and had experience with diabetes care delivered the GSD eHealth intervention to patients in general practices. The GSD eHealth intervention was delivered along with regular care, which

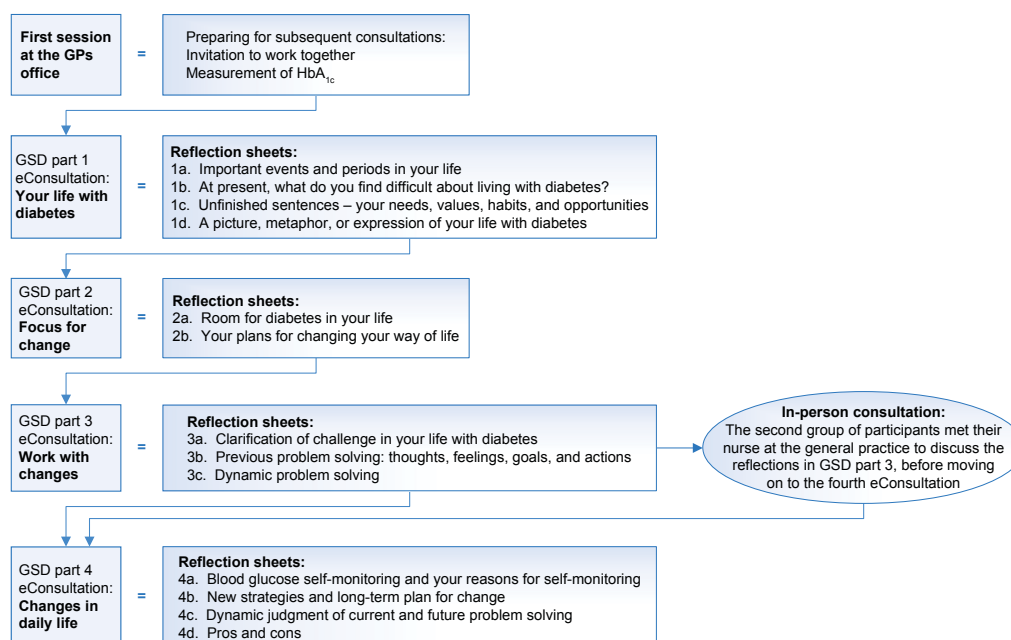


Figure 1 Overview of the GSD eHealth program for adults with T2DM.

Abbreviations: GP, general practitioner; GSD, Guided Self-Determination; HbA_{1c}, glycosylated hemoglobin; T2DM, type 2 diabetes mellitus.

for individuals with T2DM in Norway consists of structured annual consultations at general practices, regular measurement of HbA_{1c}, and additional consultations as per individual needs.⁵ Initially, nurses and participants met face-to-face in order to establish a relationship, during which the nurse explained the aim of the GSD program, how to log on to the Web portal (www.MinJournal.no) and use the secure messaging system, and how to complete the reflection sheets. The Web portal requires electronic identification via BankID, which is aligned with the level of security necessary to allow for transfer of sensitive information in Norway. All participants received a comprehensive manual that described how to use the Web portal. After the initial meeting, participants received the reflection sheets in PDF format via 4 eHealth consultations. They were asked to reflect on and write about their thoughts, feelings, experiences, and difficulties related to the self-management of T2DM, as well as to formulate goals and action plans for adequate self-management of T2DM, and return the completed reflection sheets to the diabetes nurse via secure messages.

The GSD eHealth intervention was initially conducted as a “pure” eHealth intervention by recording responses to the reflection sheets in writing and communicating via secure messages. Due to a long duration (up to 35 weeks) and a large

dropout rate, the approach was modified to a “blended” intervention, including 1 in-person consultation with the nurse following the third eHealth consultation.³⁶ The participants who were offered an additional in-person meeting completed the intervention in about 12 weeks. Figure 1 presents an overview of the GSD eHealth intervention for T2DM, along with the topics of the 13 reflection sheets and a description of the 1 additional in-person meeting.

Patients and methods

Participants and procedure

At 8 general practices in Norway, participants were recruited by their nurse or general practitioner to participate in the GSD eHealth intervention. Patients were eligible if they had been diagnosed with T2DM for >3 months, were at least 18 years of age, could read and communicate in Norwegian, had regular access to the Internet and a computer, and had a registered BankID (a secure personal electronic identification that was necessary to access the Web portal). Patients were excluded if they had severe physical or mental illness that would limit their ability to participate in the study.

A total of 25 patients (18 in the “pure” eHealth intervention, and 7 in the “blended” intervention) from southwestern Norway were invited to participate in the study. Five of the

18 patients in the “pure” eHealth intervention completed the study, and the large proportion of dropouts in this group has been described elsewhere.³⁶ Five of the 7 patients in the “blended” intervention completed the study. Hence, the current study included 10 participants (6 female, 4 male). After completing the intervention, participants were asked by their nurses to take part in an individual interview with an investigator at a time and place of their choosing. All 10 participants agreed to this request. Table 1 presents the characteristics of the study participants.

Data collection

A semistructured interview guide was used to organize the interviews. Participants were invited to speak freely about the theme addressed in the main question, namely, “What was your overall experience with the GSD eHealth counseling program?” During the conversation, the interviewer asked supplementary questions to clarify and elaborate on participants’ responses, including “How did you experience writing your reflections on the digital reflection sheets?” and “How did writing reflections influence your motivation for diabetes self-management?” At the end of each interview, participants were asked to supplement their responses with other experiences related to the GSD eHealth intervention in order to ensure adequate representation of their perspective in the data. On average, interviews took 70 minutes to complete, and all interviews were audiotaped and transcribed

verbatim. The interviews were conducted in Norwegian. Relevant meaning units were translated into English during the analysis process, and the translation has been text edited. Demographic and clinical data were collected via a questionnaire at baseline.

Ethical considerations

The Norwegian Regional Committee for Medical and Health Research Ethics (REK West, number 2015/60) approved the study protocol. Prior to the beginning of the study, participants signed a written consent form and were guaranteed anonymity and the right to withdraw from the study at any time. Anonymity was ensured by severing the link between participant names and the ID numbers and transcripts of the interviews.

Data analysis

We performed a qualitative content analysis, as described by Graneheim and Lundman,³⁷ which involved reading in full the unit of analysis (namely, all 10 transcribed interviews). Data from both groups of participants were analyzed together, as the theme focused on experiences with the reflection sheets and writing reflections in the context of the GSD eHealth intervention and how doing so might affect motivation for self-management of T2DM. Meaning units that corresponded to the aim of the study (namely, experiences with using reflection sheets to stimulate written reflection, and how written reflection might affect motivation for self-management of T2DM) were identified and shortened while retaining the main experience, and then labeled with codes. Codes were systematically organized according to their similarities and differences and placed in categories, which describe “what” participants talked about and represent the manifest content of the text. Revision of the codes and the names of categories occurred several times during the process of analysis. Finally, the latent content, or underlying meaning, was interpreted and represented in the subthemes and main themes, which characterize the “‘meaningful essence’ that runs through the data”.³⁸ Table 2 presents the themes and subthemes derived

Table 1 Characteristics of the study participants

Characteristics	Value
Sex, n	
Female	6
Male	4
Age, mean (range), years	51 (39–64)
HbA _{1c} , mean (range), %	7.5 (6.0–9.7)
BMI, mean (range), kg/m ²	32 (25–39)
Diabetes duration, median (range)	4 (3 months–15 years)
Living situation, n	
Alone	1
With family	9
Educational status, n	
Higher education >4 years	1
Higher education <4 years	4
Upper secondary education	4
Primary school	1
Occupational status, n	
Working full time	6
Working part time	1
Retirement pensioner	1
Receiver of disability benefit	1
Unemployed	1
Diabetes treatment, n	
Diet only	3
Oral or other medications	5
Insulin	2

Abbreviations: BMI, body mass index; HbA_{1c}, glycosylated hemoglobin.

Table 2 Themes and subthemes derived from the qualitative content analysis

Themes	Subthemes
Written reflection affects awareness and commitment in diabetes self-management	Writing creates space and time for autonomous reflection Writing influences individuals' focus in diabetes self-management
Written reflection is perceived as inapplicable in diabetes self-management	Responding in writing is difficult The timing of the writing is inappropriate

from the qualitative content analysis. Abstraction was done in collaboration with coauthors to ensure credibility and to enhance the likelihood that a probable interpretation of the text was obtained.

Findings

The qualitative content analysis yielded 2 main themes (Table 2) that describe how adults with T2DM experience using reflection sheets to stimulate written reflection in the context of the GSD eHealth intervention and how written reflection might affect their motivation for self-management of T2DM. We labeled the first theme as “Written reflection affects awareness and commitment in diabetes self-management”, which reflects 2 subthemes, namely, “Writing creates space and time for autonomous reflection” and “Writing influences individuals’ focus in diabetes self-management”. We labeled the second theme as “Written reflection is perceived as inapplicable in diabetes self-management”, which reflects 2 subthemes, namely, “Responding in writing is difficult” and “The timing of the writing is inappropriate”. In the following sections, we describe in detail the content of these themes and subthemes using direct quotations from participants.

Written reflection affects awareness and commitment in diabetes self-management

Participants suggested that by creating space and time to express thoughts and feelings, writing affords an opportunity for reflection on what is important for them in diabetes self-management. In addition, writing creates transparency and concretizes ideas, which influences focus in diabetes self-management. Hence, written reflection affects awareness and commitment in diabetes self-management.

Writing creates space and time for autonomous reflection

Participants appreciated the opportunity for reflection in the peace and quiet of their homes, as well as the ability for written reflection without interruption. Participants also valued the opportunity to decide on the timing of their written reflection amid their busy lives, as well as the opportunity to let thoughts “simmer” for a while, which was conducive to mature and thoughtful responses.

I appreciated having the opportunity to sit and relax and fill out [the reflection sheets] in peace and quiet, and to do it when it suited me. That I had time to sit down and prioritize doing it. To sit down and be able to use the time I needed to think through my answers [...]. [Participant 10]

With reflection, participants came to discover aspects of themselves and their reactions to situations of which they had not been aware previously. Participants also appreciated the intellectual stimulation represented by written reflection, through which they could focus on concrete issues and express mature thoughts.

Writing challenges you much more intellectually. That is why writing is very useful. If you just sit and talk, you may put much more emotions into things. When you sit down and write, you dispose some of the emotional, the sentimental, part. You write down your thoughts, cognitive, how you experience the situation. That is why I like to be challenged on that. [Participant 1]

Participants valued the personal nature of written reflection, which afforded an opportunity to think through their responses thoroughly rather than be interrupted with clarifying questions, as typically happens in conversations. Participants considered written reflection to be a useful clinical tool (in addition to traditional health care) because the reflection sheets focused on the psychosocial aspects of having and managing diabetes, and such experiences are important to share with the diabetes nurse.

Earlier follow-up has just been blood samples and other tests, and then finished and “good bye”. I have not had time to express thoughts and emotions, and [...] That was what I appreciated, that I could finally communicate with someone about it. How I experience all of it. [Participant 2]

For some participants, written reflection sparked an interest in discussing matters related to self-management of T2DM with their family, which afforded an opportunity for enhanced openness and understanding with important others.

Writing influences individuals’ focus in diabetes self-management

Participants used reflection sheets to create focus in diabetes self-management, as their responses were “in writing”. With the opportunity for written reflection, participants created a positive commitment to their goals and action plans, which became specific, concrete, transparent, and manageable and, moreover, could be reviewed after the conclusion of the eHealth consultations.

It becomes more concrete than when it is just in your head. Maybe for some people when they have written it down, I will not say that it becomes a contract, but yet more concrete than when it is just feelings and thoughts. [Participant 4]

Yet interestingly, some participants expressed the opposite sentiment, such that written reflection can be embellished and/or forgotten after the responses are sent to the diabetes nurse. In response to the Interviewer's question, "Would you go back and check on your goal setting?" 1 participant said, "No, there is no imminent danger of that ever occurring."

Written reflection is perceived as inapplicable in diabetes self-management

Some participants found it difficult to understand the reflection sheets and respond in writing. Other participants perceived the questions to be repetitive or unnecessary for them. Finally, some participants thought that the timing of the writing was inappropriate, for various reasons. Hence, written reflection is perceived as inapplicable in diabetes self-management.

Responding in writing is difficult

Some participants mentioned that they struggled with writing in general, whereas others suggested that the writing would have been easier if the reflection sheets were on paper rather than digital. One participant found it difficult to comprehend the questions and, therefore, enlisted family members to help make sense of the reflection sheets. For some of the participants who were offered an in-person meeting following the third eHealth consultation, it was important to discuss the reflection sheets with the diabetes nurse.

I had some problems understanding some of the questions on the reflection sheets. So when I came to see the nurse, I had to say "I don't know what this means", and then she had to explain what it meant. [Participant 7]

Some participants noted the importance of further instruction on how to complete the reflection sheets. Additionally, some participants found the language of the reflection sheets to be "too academic". Other participants found some of the reflection sheets (especially on "Work with changes" [Figure 1]) to be repetitive and difficult to understand/respond to in writing.

But then there were these reflection sheets where I felt like [...] first you were supposed to write about your observations, your thoughts, and feelings. I found those a little hard to separate really. Your observations [...]. What do they mean with that? And then your thoughts and feelings. And then the observations. There you were supposed to write a little without thoughts and feelings? I found this difficult [...]. [Participant 5]

Finally, due to the "locked-to-form" nature of the reflection sheets, some participants perceived less opportunity

for elaboration of responses based on individual needs and preferences.

The timing of the writing is inappropriate

Some participants suggested that the GSD program was introduced either too early or too late in their disease trajectory for them to receive a benefit from written reflection. For some participants, written reflection conflicted with their expectations for a self-management support program. In particular, these participants viewed working with the reflection sheets as too time consuming, likely to create unnecessary problems and concerns, and inapplicable to their current life experience. Other participants focused on personal matters, such as family, relationships, and multimorbidity that undermined their perceived benefit from and opinion of written reflection. They assumed that they were supposed to deal only with specific diabetes self-management behaviors, such as diet and exercise in their written reflections and goal setting. Taken together, the timing of the writing was inappropriate for some participants.

Because you also have other things to deal with. You cannot just put all that aside and simply focus on [diabetes self-management behaviors], right. The other things are there all the time, in the back of my head. [Participant 6]

Discussion

The aim of the current study was to explore how adults with T2DM experience using reflection sheets to stimulate written reflection in the context of the GSD eHealth intervention and how written reflection might affect their motivation for self-management of T2DM. The findings indicate that participants had diverse experiences with the digital reflection sheets and written reflection more broadly. Some participants experienced written reflection as positively affecting their awareness and commitment in diabetes self-management. On the other hand, some participants experienced difficulties in writing their reflections and perceived this as inapplicable in diabetes self-management. In the following sections, we discuss our findings in the context of previous research and SDT.

Written reflection affects awareness and commitment in diabetes self-management

One important finding in the current study is that the writing initiated by the digital reflection sheets creates space and time for autonomous reflection, which was experienced as more positive than ordinary follow-up at the general practice. With written reflection, participants were able to

identify and put into words their personal experiences and difficulties with self-management of T2DM. As the necessary behaviors for self-management of T2DM are demanding and may not have inherent interest for the individual, it is important to support autonomy in health care in order to facilitate optimal, autonomous motivation for diabetes self-management.^{22,27} Individuals experience a sense of autonomy when their behavior is congruent with deeply held values, beliefs, and interests.²⁴ Written reflection in the context of the GSD eHealth intervention may be perceived as autonomy supportive, such that it engenders an experience of self-governance and volition in patients. These findings build on previous research in which adults with type 1 diabetes perceived their health care climate as more autonomy supportive after participating in the GSD intervention.¹³

Another important finding is that writing influences individuals' focus in diabetes self-management. For some participants, responding to the reflection sheets and then sending these to the diabetes nurse assist in helping to create specific goals and clear action plans, in addition to concretizing what is necessary to attain their goals. The autonomous reflection and the focus created by the writing may have facilitated healthy, autonomous goal setting in the self-management of T2DM. This is important because specific goals are much more effective than general goals for developing effective self-management behaviors.^{7,39} Previous research has shown that active involvement in goal setting is conducive to patients' regulating their self-management behaviors and attaining positive treatment outcomes.²³ Moreover, competence is supported when individuals pursue goals that they have an opportunity to attain, thereby experiencing a sense of achievement in reaching their goals.^{24,27}

Our findings indicate that the GSD eHealth intervention may provide support for patients' competence – as well as autonomy. Indeed, support for competence has been associated with treatment adherence, quality of life, and glycemic control in patients with T2DM.^{4,26} With these findings in mind, we suggest that written reflection in the context of the GSD eHealth intervention may be conducive to positive treatment outcomes because of its potential to support autonomy and competence around self-management of T2DM.

Written reflection is perceived as inapplicable in diabetes self-management

Our findings also indicate that the GSD eHealth intervention may be described as a “double-edged sword”. For some participants, written reflection may affect their awareness and commitment in diabetes self-management in a positive way, whereas for other participants, written reflection was

perceived as inapplicable in diabetes self-management. Our findings suggest that responding in writing is difficult and that the timing of the writing is inappropriate for some patients, and thus participants may not value and/or benefit from written reflection in a uniform way. These findings suggest that the reflection sheets might require further adaption for adults with T2DM in an eHealth intervention.

In the current study, the reflection sheets were completed electronically, which contrasts with previous research on the GSD intervention.^{13,14,18} Research on therapeutic writing has shown that the effectiveness of writing as a therapeutic tool depends on support and assistance during the writing process.³¹ Moreover, in previous research showing that the GSD intervention can develop life skills and reduce psychosocial distress in individuals with type 1 diabetes, participants completed the reflection sheets on paper at home as preparation for an in-person consultation with health care personnel, which may facilitate dialogue around assistance with, explanation for, and tailoring of the intervention.^{13–19} The fact that the written reflection and communication with health care personnel occurred primarily electronically may have undermined perceptions of support for some participants.

It is interesting to note that some participants who were offered an in-person meeting following the third eHealth consultation mentioned that their meeting with the diabetes nurse was crucial for understanding the reflection sheets. This finding underscores the importance of in-person consultation that offers assistance to participants around the GSD eHealth intervention and builds on our previous research that revealed participants' missing of in-person consultations with the diabetes nurse as an important contributor to dropping out from the study.³⁶ In-person consultation with health care personnel allows for advice based on user reactions to be communicated in real time, which can facilitate engagement in eHealth interventions. Of course, additional in-person consultation can increase the cost and time required for completion of eHealth interventions, in addition to reducing reach into the population.⁴⁰ Nonetheless, we anticipate that the benefits associated with in-person consultation are likely to outweigh the costs.

Some participants considered the timing of the writing to be inappropriate, and thus this aspect of the intervention did not suit them for various reasons. Whereas some participants had a different focus and/or additional challenges in life, others were able to manage their diabetes well without much to consider in written reflection. Hence, it is important to consider the timing of eHealth interventions with regard to disease trajectory, personal needs, and anticipated strains in life.⁴¹ Furthermore, although – ideally – the reflection

sheets can be used to consider a broad range of topics in life, participants tend to focus on specific diabetes self-management activities in their goal setting, such as diet and exercise. Future research on written reflection might attempt to strike more of a balance between focusing participants on broad life issues versus specific issues relevant to diabetes self-management.

It is also interesting to consider how the concept of causality orientations within SDT⁴² might affect perceptions of the timing of the writing as inappropriate. The concept of a causality orientation describes differences in how individuals initiate and regulate their behaviors over extended periods of time, and this concept has received considerable empirical attention.^{24,43} With an autonomy orientation, individuals initiate and regulate their behavior based on personal interest, value, and choice. In contrast, with a controlled orientation, individuals initiate and regulate their behavior based on self- and/or other-imposed perceptions of pressure, coercion, and control.⁴² Certainly, differences in causality orientation might affect the focus of written reflection, the self-management goals that are adopted, and the perception of the GSD eHealth intervention as appropriately timed and beneficial. It is reasonable to speculate that those participants who asserted that written reflection affects awareness and commitment in diabetes self-management (Theme 1) are more likely to have an autonomy causality orientation than those who asserted that written reflection is inapplicable in diabetes self-management (Theme 2). Indeed, individuals who score higher on the controlled causality orientation tend to benefit less from health initiatives such as the GSD program.⁴² Future research on written reflection might examine whether and how the causality orientations affect the amount of benefit that participants derive from the GSD eHealth intervention.

Strengths and limitations

Several strengths and limitations deserve mention. One strength of the current study was its qualitative design with semi-structured interviews during which participants could give voice to their experience with the GSD eHealth intervention. One limitation was the small number of informants ($n=10$); yet it is important to note that the sample consisted of all participants who completed the GSD eHealth intervention, which precluded the possibility of further recruitment. Indeed, the fact that all participants who completed the intervention agreed to take part in our interviews is a notable strength of the current study. A second strength was that 1 investigator conducted all of

the interviews in order to ensure the credibility of the data collection. Undeniably, our findings and interpretations were discussed by all coauthors during analysis and manuscript drafting, which may enhance the trustworthiness of our conclusions. That being said, because a text can have >1 meaning and interpretations are subjective, we cannot dismiss the possibility that others would have interpreted our findings in a different way.^{37,38} A second limitation was the heterogeneity in educational status of the study participants, which might have affected how participants responded to the reflection sheets. Half of the participants in the current study had primary or secondary education as their highest level of education. That being said, we found no indication that participants with less education experienced writing as more difficult than those with more education, which may be due to the limits of our small sample size. Thus, it is important for future research with a larger sample size to examine how educational status affects responses to and benefits from written reflection, given the cognitive demands of this component of the eHealth intervention.

Conclusion

Written reflection stimulated by digital reflection sheets may affect awareness and commitment in diabetes self-management in a positive way by creating space and time for autonomous reflection and influencing individuals' focus in diabetes self-management. Interpreted through the lens of SDT, it is possible that written reflection in the context of the GSD eHealth intervention can support patients' autonomy and competence, which are conducive to autonomous (ie, optimal) motivation for diabetes self-management and positive treatment outcomes. That being said, the structured nature of written reflection in the context of the GSD eHealth intervention may be inapplicable for some participants, as responding in writing can be difficult and the timing of the writing can be inappropriate. Therefore, it seems that in-person consultation with the diabetes nurse may be necessary to achieve the full potential benefit of the GSD as an eHealth intervention. Hence, we advocate for further development and examination of the GSD as a "blended" approach, especially for those who consider written reflection to be difficult or unfamiliar.

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Author contributions

SSL, BK, MG, and BO developed the study design. The interviews, transcriptions, tentative analysis, and first draft of the article were performed by SSL. BK, CPN, MG, and BO were involved in analysis of the data, writing the manuscript, and revising the manuscript for intellectual content. All authors gave final approval of the version to be published and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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Paper III

The influence of an eHealth intervention for adults with type 2 diabetes on the patient-nurse relationship: A qualitative study

Introduction

Type 2 diabetes (T2DM) is a chronic condition that has affected one out of every 11 adults in the world: its prevalence is rapidly increasing [1]. Self-management is integral in diabetes treatment, and requires each person to make a multitude of daily decisions and engage in complex care activities [2]. The increasing number of people affected by T2DM combined with most patients not reaching recommended treatment goals point to the importance of developing new and efficient modes of delivering self-management support interventions [3, 4]. Self-management support for persons with T2DM refers to ongoing assistance from, for instance, registered nurses (RNs) in implementing and sustaining self-management behaviors [3]. As RNs in general practice are essential in providing T2DM care in Scandinavian primary health care, they also have a central role in self-management support for this patient group. A constructive patient-nurse relationship with effective communication and collaboration is conducive for self-management support [2, 5, 6].

Relatedness defines relationships characterized by connection, understanding and trust. According to self-determination theory (SDT), relatedness is a basic psychological need inherent in all people. The support of relatedness, autonomy and competence in health care for people with T2DM may foster optimal motivation for self-management behaviors [7]. RNs may support patients' sense of relatedness by actively and empathetically listening to them and providing social support [8]. A constructive patient-nurse relationship may enhance the patient's health and strengthen the patient's own resources for maintaining physical, emotional, mental and social well-being [9]. eHealth interventions are new in health care and pose challenges to the traditional patient-nurse relationship. Previously, the main component of forming a good relationship have included face-to-face interaction and communication through verbal language, behaviors, facial expressions and gestures [10, 11]. Core differences between "regular" contact and eHealth contact between patients and RNs include fewer

physical interactions and a potential change from face-to-face communication to asynchronous written communication. Research indicates that eHealth interventions hold a potential for diabetes self-management support [12, 13].

We have published research on the adaptation of a self-management support intervention, the Guided Self-Determination program (GSD) as an eHealth intervention for adults with T2DM [14, 15], hence called the eGSD. The aim of the eGSD is to assist communication and a mutual understanding between the patient and RN, and promote empowerment in the diabetes self-management approach by using electronic reflection sheets and written asynchronous communication [16-18]. The communication was primarily conducted via secure messaging in the eGSD. Because of its flexibility, this feature can improve the efficiency and reach of self-management support interventions, and accommodate the schedules and daily lives of both RNs and patients in a changing society [19]. Previous studies found by using the “original” GSD program, patients and health care professionals (HCP) improved shared decision making and established meaningful relationships that supported patients’ empowerment and motivation were supported [16, 20]. We were interested in exploring how the eGSD influences the patient-nurse relationship.

To inform this study, we conducted literature searches to identify articles exploring how eHealth influences the patient-nurse relationship. We found only two earlier qualitative studies that explored 1) how telecare with video-communication influenced the relationship between RNs and caregivers of people with various chronic conditions living at home [11]; and 2) how internet use (i.e. health information seeking) affects the client–professional relationship among midwives compared to related professions [21]. The former concluded the flexibility of eHealth services provides a possibility of engaging in a closer or a more distant relationship, depending on the participants’ attitudes towards eHealth [11]. The latter suggest that HCP are experiencing new forms of interaction with their patients caused by internet use, as the patients are more informed and better prepared for the meeting. However, RNs assess that internet has a limited effect on transforming the traditional client-professional relationship.

To the best of our knowledge, to date there are no studies addressing how eHealth self-management support interventions with written asynchronous communication influence the relationship between patients and nurses. The aim of this study was therefore to explore how the eGSD influences the patient-nurse relationship from the perspective of patients participating in the eGSD and the RNs conducting the intervention.

Materials and Methods

Design

This study is part of a larger project developing a complex eHealth intervention for adults with T2DM who are treated in general practices in Norway. We used a qualitative design in the pilot phase [14, 22]. Data were collected through individual interviews with ten patients who completed the intervention, and with four RNs who delivered the eGSD.

Description of the eGSD

RNs trained in GSD counselling delivered the eGSD to patients at general practices. The eGSD was executed via the web portal www.MinJournal.no. This web portal demands electronic identification with BankID (secure personal electronic identification), providing the necessary security level to allow the transfer of sensitive information demanded by Norwegian legislation.

The GSD intervention is theoretically based on i.a. the motivational SDT [16]. A main feature of the eGSD is the use of reflection sheets, divided into four eConsultations. They focus on (1) the patient's experiences living with diabetes, (2) the patient's focus for change, (3) mutual planning changes and problem solving, and (4) strategies for conducting changes in daily life (see supplementary material 1). The intention of the reflection sheets is to enable patients and RNs to establish a relationship in which the patients' values and needs are clarified. It also supports patients in prioritizing problems and self-determining their goals, thus stimulating patients' autonomy and competence for self-managing diabetes [23].

After a first meeting at the general practice, the RNs sent the reflection sheets belonging to each eConsultation to the patients via secure messages. After completing the reflection sheets on their own

electronic device at home, patients returned these to their RN, who responded in writing. Each eConsultation thus consisted of two to four message exchanges. Half of the participants conducted the eGSD in writing (as a “pure” eHealth intervention); the RNs included in this study and the second half of the participants conducted the intervention as a so-called “blended” eHealth intervention, with an additional in-person meeting for discussion of the reflections belonging to the third eConsultation. The development and the process of the eGSD as well as the shift from “pure” to “blended” eGSD are described in detail elsewhere [14, 18, 24].

Recruitment and participants

RNs had initially recruited patients to the intervention from their general practice, by the following inclusion criteria: diagnosed with T2DM >3 months, age >18 years, able to communicate in writing in Norwegian, regular access to internet and computer, and having registered a BankID. Exclusion criteria were severe physical or mental illness limiting the patients’ ability to participate in the intervention. After patients had completed the intervention, “pure” version (n=5), or “blended” version (n=5), the RNs asked if they were willing to take part in an individual interview with a researcher at a place and time of their choosing. Ten adult patients with T2DM completed the intervention and consented to interviews (table 1).

Four nurses who conducted the “blended” eGSD agreed to participate in individual interviews, after completing the eGSD with their patients (table 2).

Table 1 Patient participants (n=10)

Gender	Female (n= 6); male (n=4)
Age range	39-64 years (mean 51)
Diabetes duration range	3 months-15 years (median 4 years)

Table 2 Nurse participants (n=4)

Gender	Female (n= 4)
Age range	47-63 years

Experience in diabetes care at general practices, range	7-10 years
Formal postgraduate education in diabetes care (60 ECTS)	n=1

Data Collection

The first author conducted all the interviews, using thematic semi-structured interview guides to direct the conversation and to ensure coverage of the topics as far as possible. Questions related to experiences with the eGSD and what it meant for the relationship are presented in Supplementary material 2. The participants were invited to speak freely about the questions. The investigator asked supplementary questions to clarify and elaborate the responses during the conversation, as is customary in semi-structured interviews. All interviews were concluded by asking if anything relevant had been left out of the conversation, to make sure the participants' points of view were included in the data. The interviews lasted around 60-70 minutes, were audiotaped and subsequently transcribed verbatim.

Data Analysis

Qualitative content analysis as described by Graneheim and Lundman [25] was chosen as the method of analysis. As this study explored experiences with the eGSD from patients' and RN's perspectives, this interpretive method focusing on differences and similarities was deemed appropriate in the current study, as it is an interpretive method focusing on differences and similarities in the text was deemed appropriate [25, 26]. This approach to qualitative content analysis identifies and interprets manifest and latent content in the text; the former incarnated in categories and the latter in themes. The analytical process encompassed first reading all 14 transcribed interviews. Data from patients and RNs were analyzed together. The meaning units responding to the aim of the study were identified and coded. Codes were organized by their differences and similarities and categorized. The categories were renamed many times, interpreted and abstracted into subthemes and subsequently into main themes. The labeling of the final themes was discussed and revised by all authors. The themes were compared with the original text and illustrative quotations from the participants were extracted and presented in the findings.

Ethical considerations

The Norwegian Regional Committee for Medical and Health Research Ethics (REK west No.2015/60) approved the study. All patients and RNs signed a written consent form and were guaranteed confidentiality and the right to withdraw from the study at any time.

Findings

Through the analysis we identified two main themes related to how patients' and RNs reported that the eGSD influenced their relationship. Each theme is based on two sub-themes (table 3). In the following text, the content of the themes and sub-themes are described in detail, with quotations from the interviews.

Table 3 Themes identified in the qualitative content analysis

Themes	Sub-themes
eGSD facilitates reciprocal understanding and flexibility in the relationship	➤ Facilitating openness in the communication ➤ Creating a lower threshold for making contact
“Calibrating” the relationship with additional in-person contact in the eGSD	➤ The importance of meeting face-to-face ➤ Communicating in writing is vulnerable

eGSD facilitates reciprocal understanding and flexibility in the relationship

Both patients and RNs emphasized they experienced the eGSD as facilitating openness in the communication and helping them getting acquainted. It also created a lower threshold for making contact and a closer follow up, both of which were experienced as beneficial for the relationship. This was interpreted as the eGSD facilitated reciprocal understanding and flexibility in the relationship.

Facilitating openness in the communication

Many patients highlighted that eGSD stimulated them to express what matters in their lives more freely. Patients became more confident in sharing the challenges of self-managing their diabetes. eGSD facilitated communication with the RN about what was important for them, which was greatly valued. Feedback received from the RN was particularly useful and appreciated. The RNs' follow-up questions to their reflections were experienced as facilitating well thought-through responses. Several patients

talked about how the intervention was useful in “getting acquainted” and that it generated confidence, understanding, cooperation and trust.

*“You create more trust when you open up to someone like this. For those people it is, I think, like a doctor, often they sit and look at all the medical stuff, but then what matters is a completely different thing ... It's not just the diagnosis and the test results. There are thoughts and feelings, and more. I felt the better we know each other, the easier it is to see “where the shoe pinches”, if it pinches [metaphorically describing a problem]. Yes, that's easier. And it makes it easier for her to give advice on things I find difficult in relation to the diagnosis, when she knows a little more about my life. Because they may say you have to exercise this much every week, you have to do all these things and you have to do it like this and like that, and so on, but perhaps the family situation indicates that I cannot do all these things. In this way they can more easily see things from my point of view, and help me and come up with tips on how I can solve it and make this work for me, in my life. **Patient #10***

All the RNs reported similar experiences and valued getting to know more about the patients' lives through eGSD. Getting to read the patients' reflections sent by secure messages improved their understanding of life situations of which they had not previously been aware, and created the possibility to address the psychosocial aspects of patients' self-management. They noted that asking similar questions verbally would have been more difficult and perhaps not feasible in a clinical encounter. However, one of the RNs underlined keeping the relationship professional with a low level of emotional involvement was crucial in digital communicating. This in order to maintain appropriate contact and etiquette, as writing alters the patient-nurse communication. Others claimed that written communication via eHealth had several advantages, particularly for the patients. The RNs noted that patients answered more candidly than they would have done face-to-face, and this kind of communication was well suited to people who do not talk or share much in their regular consultations.

I did feel they opened up more, and maybe answered more personally. Yes, opened up more and told me things they might not have done face-to-face. That was the kind of feeling I got. And I

think it was good, because then they get to share this, and at the same time I feel like they trust me when they expose these things. RN #1

Moreover, the RNs said that the patients had more time to think about what they wanted to share. Writing and spending time thinking about and editing their responses was interpreted as giving patients increased control of the information flow.

I think the patients benefit a lot from the written communication. Because they are able to think thoroughly through and have the possibility to decide for themselves how much they want to share. RN #4

Creating a lower threshold for contact

The eGSD was described as creating the possibility of frequent and efficient contact between patients and RNs in the intervention period. This was interpreted as creating a lower threshold for making contact. All patients were familiar with communicating via electronic messages. This kind of communication was considered more effective and easier than contacting the RN or the general practice in some other way. However, informants described that having a scheduled appointment for completing the reflection sheets was necessary to avoid postponing the task. The structured approach with the close contact and extra follow-up was valued and described as “out of the ordinary” by the patients.

I valued getting the extra follow-up [...] And because you had that contact with the nurse [...] if I had questions, I could write to her instead of having to book an appointment at the GP. The threshold to get in touch with them and ask about things became so much lower. Patient # 10

The RNs claimed that the web contact creates freedom of choice, and that close contact and follow-up create motivation for the patient. They appreciated eHealth’s expected potential for improving the patient-nurse relationship, by increasing the reach of diabetes health care because of the flexibility and the ease of making contact. However, this was described as more of an advantage for the patients than for the RNs themselves. This new way of relating to and communicating with patients was more time-consuming for the RNs than is meeting the patient in a regular consultation. They underlined the

importance of having more time for written communication in the eGSD. They claimed that their skills with written communication and forming relationships with the patients in this way would improve with training and practice. They expected such training would assist them in attaining a sense of mastery and security with written communication with their patients.

I think this could be a good way of communicating with patients. When we have the time for it and it becomes a routine, then it will go much faster I think. When we know more about how to communicate with the patients. RN #3

“Calibrating” the relationship with additional in-person contact in the eGSD

Both patients and RNs described the importance of meeting face-to-face and preferred a combination of eHealth and regular consultations. RNs stated that written communication with patients is vulnerable, and feared such communication could lead to misunderstandings. Together, this was interpreted as additional in-person meetings “calibrated” the patient-nurse relationship.

The importance of meeting face-to-face

This sub-theme demonstrates that both patients and RNs described the importance of meeting each other in person. The patients who participated in the “pure” eGSD mentioned they would have preferred an additional in-person meeting. The patients and RNs who conducted the “blended” eGSD described the additional in-person meeting as vital for establishing trust and a closer relationship. The “pure” eGSD was described as insufficient. Writing without in-person meetings does not create interpersonal contact, and contributes to an unwanted “faceless” society. Moreover, some patients thought that something is “lost” between two people when communication happens only in writing. In person communication was described as “personal”, in contrast to “impersonal” electronic communication. Digital communication also precluded an immediate response.

I think web-based counseling can be very good, you can get responses related to your condition, and you can get many health-responses through the web-based counseling. Maybe sometimes most of what you need. But I think I will never refrain from having direct person-to-person contact related to health issues. Because there is something between two people, being able to

respond immediately, I think this will never be outdated. I need this. I would never be able to manage without this part. Patient # 1

However, most patients agreed a combination facilitates an improved relationship. The eGSD was described as a positive part of a diverse health care. Correspondingly, the RNs described a combination between eHealth and in-person meetings was necessary:

I think the meeting was very important. The way I experienced it, the patients got the face-to-face part, and additionally they saw that I had understood and reflected on and thought about what they had communicated to me in writing. And then it makes more sense to continue, because you see there is a purpose to it. I do think the meeting was completely vital!

RN # 4

The meeting was particularly valuable because communicating in person confirmed the assumptions and interpretations the RNs had made when communicating in writing, and made explaining and summing up possible. The RNs found it easier to “read” the patient, adapt, and tailor the information when meeting in person.

Communicating in written is vulnerable

Both patients and RNs described challenges with communicating in writing, and that such communication is vulnerable as it renders difficult asking questions for clearing up:

The biggest difference is that when talking, you can answer me and tell me right away the things I'm not certain of. If I'm “stuck” on a question, I can ask you. That's not as easy online you know. You don't get a response then and there as you might have wanted. You would have gotten that in a face-to-face meeting, right. Patient # 6

The RNs' expressed worries about possible misunderstandings when communicating in writing. They noted uncertainties concerning how their written responses to the patients' reflection sheets would be perceived by the patients. They described putting strains on their written messages because they worried about the lack of explaining or adapting the information to the patient or the situation. This was because they felt they lost control over the written word. Written communication was described as impersonal

because of the loss of essential non-verbal communication. This influenced emotional aspect and the depth of the communication, and thus the patient-nurse relationship. They also described losing the possibility of using humor or support-words to soften their message.

Words may be experienced harder because they are in writing. You lose all the support-words that you have in verbal communication. They are lost in writing. Therefore, it will be much harder. You can moderate a little bit or use humor verbally. This is lost in writing. So even though I had time to reflect, time to think, I don't know if the communication ultimately was better. Because you lose so many valuable things. RN # 4

Discussion

The study set out to explore experiences of patients with T2DM and RNs on how the eGSD, piloted in general practice, influenced their relationship. Our findings suggest the eGSD *facilitates reciprocal understanding and flexibility in the relationship*. This aligns well with the aim of the GSD; to assist communication and a mutual understanding between the patient and the RN, and promote empowerment in the diabetes self-management support [16, 17, 23]. Our findings indicate the eGSD allows patients to share psychosocial aspects of their lives with the RN and discuss what matters the most to them. Thus, they can invite the RN to “enter their world”, enabling a deeper understanding of their specific situation. As openness and trust in the communication are arguably fundamental for caring in the patient-nurse relationship and are important components of the basic psychological need of relatedness, we suggest the eGSD may support relatedness [7, 27, 28]. According to SDT, this is of significance in self-management support, as relatedness in the patient-nurse relationship may improve and maintain patients’ motivation for the often-demanding diabetes self-management behaviors [7, 9, 29, 30].

Our findings build on earlier research suggesting that digital communication allows highly emotional and intimate communication, and may help patients talk about difficult aspects of their conditions and thus develop a constructive relationship with the RN [31]. These findings are important, as many patients claim that HCP do not have time to listen to them in regular consultations [32]. Asynchronous email interaction between patients and HCP have been argued to be more person-centered

than traditional office visits [33]. Perhaps our findings, combined with findings from earlier research indicate that eHealth may, for some people, contribute to improved patient-HCP communication. Thus, eHealth services might be a step in the direction of a health care system that provides person-centered care.

Moreover, our findings indicate patients value the flexibility of digital access to the reflection sheets and the asynchronous communication. This adds to previous research suggesting adults with T2DM prefer eHealth interventions that are accessible at all times, and although secure messaging is asynchronous, it confers a sense of availability and connection [34, 35]. However, interestingly both patients and RNs mentioned that scheduled appointments were also beneficial when communicating via asynchronous secure messages. This adds an interesting nuance to the argued benefits of asynchronous contact, and is something to be addressed and explored in future eHealth research. Besides, the eHealth approach was more convenient for the patients than for the nurses. eHealth differs from regular meetings in the general practice, and changes how and when the communication is conducted. How to manage asynchronous message exchanges in RNs' hectic workdays, in addition to "how to" communicate in writing compared to face-to-face, seems important for future research. As HCP are integral for implementation and success of eHealth interventions and strategies, it seems essential to figure out how to develop eHealth interventions that are beneficial for both HCP and patients.

Even though eGSD had some positive outcomes for the patient-nurse relationship, our findings also show both patients and RNs prefer the "blended" eGSD (or follow-up as regular), as they can *calibrate the relationship with additional in-person contact*. This builds on findings from an earlier study suggesting "hybrid" versions of eHealth is necessary to strengthen the patient-nurse relationship [36]. Particularly the RNs were concerned about the risk of misunderstandings when communicating asynchronously in writing. This is an unfamiliar and novel method of relating to patients. They articulated written communication reduced their possibility of seeing and responding immediately to the patients' reactions in a professional and caring manner. The RNs have responsibility for the patient-nurse relationship, which may explain why this was a concern for them. Earlier research argues the

importance of replying accurately and in an explicitly caring way in eHealth interventions [37]. This is vital because of the lack of nonverbal cues, and because the written word is permanent. The concerns for misunderstandings and the changes this imposes on what is communicated from the HCPs side are important matters to address and explore further as eHealth interventions become prevalent.

Even though many people in industrial countries use messaging and emailing each day, the use of such communication tools in health care is a somewhat recent feature and remains undeveloped and unexplored [38]. Most RNs working today were not trained in eHealth services during their education. The complex tasks of maintaining a professional relationship with written communication, be both “close” to the patient by the flexible written communication as well as maintain a professional approach as well as prioritize the time-spend may be challenging for HCPs. For fruitful patient-nurse relationships when communicating via eHealth, it seems vital to provide thorough instructions and models, and facilitate education for HCP in these new ways and means of communicating. Our findings may advocate for leaders and researchers to put in order more systematic “communication via eHealth” training options for RNs as part of the continuous professional development strategy in the clinic. These recommendations build on earlier research addressing the importance of delivering proper, purposeful and needs-oriented training in using eHealth to HCP [39, 40]. These are important implications for institutions educating HCP, as well as health care institutions implementing eHealth and expecting their employees to master it.

Methodological considerations

Findings from this study reflect insights derived from individual interviews with patients and RNs taking part in the eGSD. All of the patients who completed the intervention participated, as well as nurses who conducted the eGSD, which might be considered a notable strength of the current study. Although the sample is small, and our findings cannot be generalized to other settings and groups, they do offer relevant information into how an eHealth intervention conducted in general practice may influence the patient-nurse relationship.

A limitation of the study is the fact that the included patients completed the intervention (n=10). Experiences with the intervention from the perspective of those who dropped out has been addressed elsewhere [24]. The patients who completed are more likely to value the intervention than those who drop out. Thus, this is probable to influence the findings in this study.

One researcher conducted all the interviews and the initial analysis, which could be considered a strength because it may ensure credibility of the data collection. The findings were discussed among all authors until we reached consensus concerning categories and themes, possibly enhancing the trustworthiness of our findings. However, the pre-understanding of the authors influenced the interpretation and analysis of the findings, and other researchers might have drawn other conclusions from the same data [41]. Pre-understandings in need of mentioning is the authors knowledge of the objective of the eGSD, and about challenges the participants encountered as addressed elsewhere [24]. In addition, both the intervention and the interview guide were informed by SDT. It is probable that the authors' theoretical understanding influenced the analysis of the data. Addressing these pre-understandings may improve the transparency of this study.

Conclusion

This study, exploring how the eGSD influences the patient-nurse relationship from the perspective of patients participating in the eGSD and the RNs conducting the intervention, indicates the eGSD facilitates reciprocal understanding and flexibility in the relationship. Both patients and RNs acknowledge these outcomes as beneficial. Nevertheless, both patients and nurses mentioned the need and preference for familiar in-person consultations and synchronous verbal communication for the sake of the relationship and to avoid misunderstandings in written communication. Thus, they need the in-person contact in the eGSD to “calibrate” the relationship.

As written communicating in eHealth is a novelty, it demands new knowledge and expertise from the RNs. This must be acknowledged when developing and implementing eHealth interventions. Thus, education programs in written eHealth communication, as well as guidelines and frameworks on how to professionally and effectively conduct such eHealth services while maintaining constructive

patient-nurse relationships should be a priority for health educational institutions, practicing health institutions and other stakeholders.

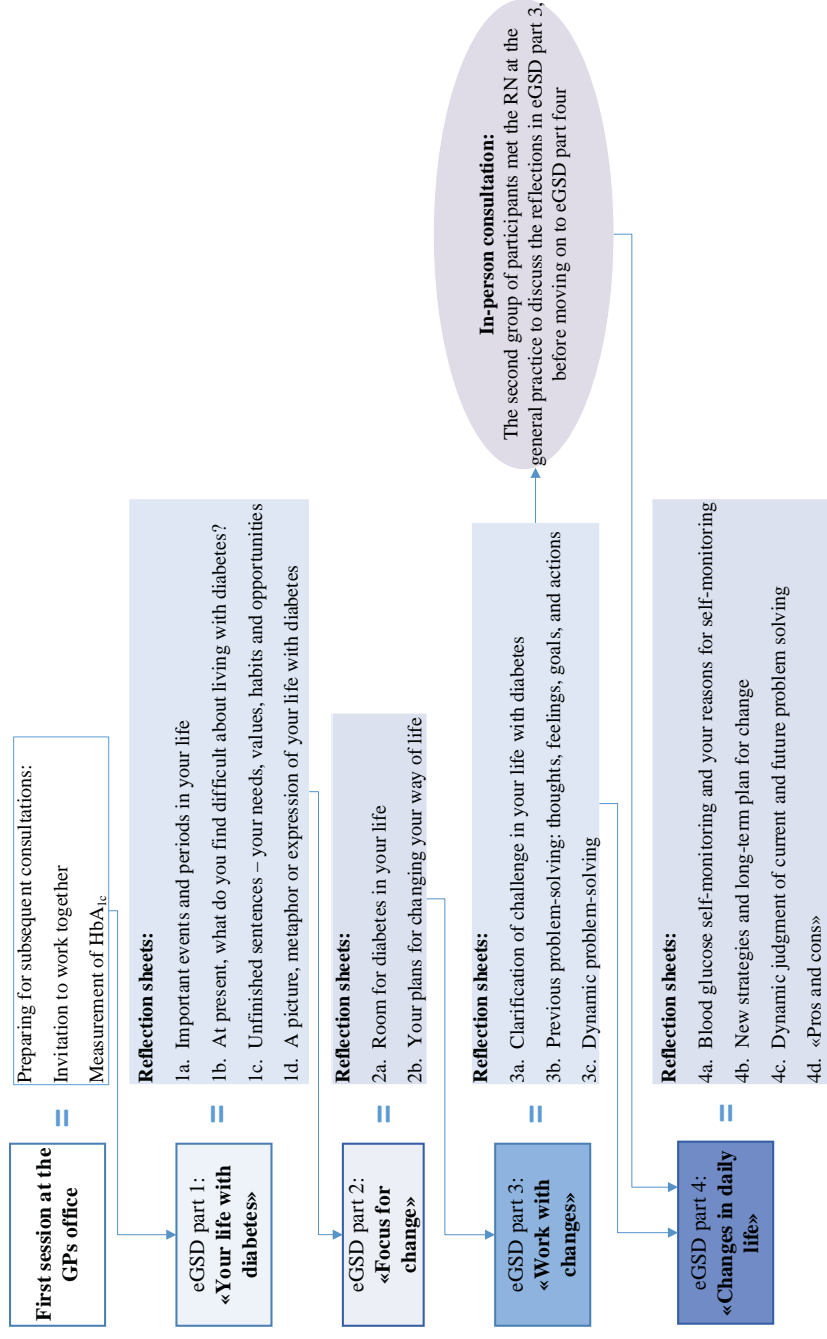
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Supplementary material 1

Overview of the eGSD



Supplementary material 2

Extract from the interview guide for patient-interviews

Main questions related to experiences with the eGSD and the relationship with the registered nurse

- What was your overall experience with the GSD counseling intervention via internet?
- How did this intervention influence your relationship with the nurse?

The second half of the patients were asked an additional question as they conducted the intervention as a “blended” eHealth approach. Apart from this, the interview guides for the patient interviews were similar.

- How did you experience meeting the RN on the third consultation?
- What did this meeting mean for your relationship?

Extract from the interview guide for RN-interviews

Main questions related to experiences with the eGSD and the relationship with the patient:

- What was your overall experiences with conducting the GSD counselling via internet for patients with T2DM?
- How did you experience the relationship between yourself and the patient when conducting the eCounseling?
- How did you experience meeting the patient in the third part of the intervention?
- What did this meeting mean for your relationship?

Appendices

Appendix 1 – Ethical approval



Regional Committee for Medical and Health Research Ethics, Western-Norway

To whom it may concern

Our ref
2015/60

Date
19.11.2015

Confirmation

I hereby confirm that the project 2015/60 «Promoting self-management in adults with type 2 diabetes. A complex intervention design for web-based guided self-determination program applicable in general practice», by Project Manager Bjørge Oftedal, is reviewed and approved by the Regional Committee for Medical and Health Research Ethics, Western-Norway.

Best regards,

Camilla Gjerstad
Committee secretary
Regional Committee for Medical and Health Research Ethics, Western-Norway



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Regional komité for medisinsk
forskningsetikk, Vest-Norge
Telefon 55 97 84 97 / 98 / 99

Besøksadresse
Haukeland
Universitetssykehus

Region:	Saksbehandler:	Telefon:	Vår dato:	Vår referanse:
REK vest	Trine Anikken Larsen	55978497	03.03.2015	2015/60/REK vest
			Deres dato:	Deres referanse:
			20.01.2015	

Vår referanse må oppgis ved alle henvendelser

Björg Oftedal
Stavanger

2015/60 Utvikling, utprøving og evaluering av web-basert veiledningsmetode i allmennpraksis for å fremme egenhåndtering av type 2 diabetes

Forskningsansvarlig: Universitetet i Stavanger

Prosjektleder: Björg Oftedal

Vi viser til søknad om forhåndsgodkjenning av ovennevnte forskningsprosjekt. Søknaden ble behandlet av Regional komité for medisinsk og helsefaglig forskningsetikk (REK vest) i møtet 12.02.2015. Vurderingen er gjort med hjemmel i helseforskningsloven (hfl.) § 10, jf. forskningsetikkloven § 4.

Prosjektomtale

Formålet med studien er å utvikle kunnskap om nettbasert veiledning for type 2 diabetes i allmennpraksis kan fremme egenhåndteringen av diabetes. Prosjektet er en del av et større forskningsprosjekt. Studien anvender complex interventions design som inkluderer tre faser i forskningsprosessen med både kvalitativ og kvantitativ tilnærming. Denne søknaden gjelder for fase 2 og 3 som skal tilpasse, vurdere og evaluere nettbasert veiledning i allmennpraksis for pasienter med type 2 diabetes. I fase 2 inngår både spørreskjemaundersøkelse og fokusgruppeintervju. Denne fasen intenderer å prøve ut hensiktsmessige og gjennomførbare forhold ved den nettbaserte veiledningen som rekrutteringsstrategier, vurdering av endelig effektstørrelser og nytten av veiledningsmetoden. Det planlegges fire fokusgrupperintervjuer med 10 deltakere i hver gruppe. Fase 3 vil ha et kvasi-eksperimentelt design med en intervensjonsgruppe og en kontrollgruppe. Målinger vil bli foretatt ved baseline, etter gjennomført program og seks måneder etter avsluttet program. Hensikten med denne fasen er å påvise effekten av det nettbaserte veiledningsprogrammet.

Vurdering

Søknad/protokoll

Komiteen anser prosjektet som viktig og interessant. Komiteen mener prosjektet vil ha betydning videre i helsetjenesten. REK vest har således ingen merknader til søknad og protokoll, og mener prosjektet er forsvarlig å gjennomføre slik det er lagt opp.

Informasjonsskriv

Komiteen ønsker at det fremgår tydeligere av informasjonsskrivet hva deltakelse i prosjektet innebærer. I tillegg må det opplyses om hvor lenge den nettbaserte veiledningsmetoden skal vare.

Revidert informasjonsskriv sendes til REK vest for vurdering.

Vilkår

- Informasjonsskrivet må revideres i henhold til komiteens merknader og sendes til REK vest for vurdering.

Vedtak

REK vest godkjenner prosjektet på betingelse av at ovennevnte vilkår tas til følge.

Sluttmelding og søknad om prosjektendring

Prosjektleder skal sende sluttmelding til REK vest på eget skjema senest 30.06.2021, jf. hfl. § 12. Prosjektleder skal sende søknad om prosjektendring til REK vest dersom det skal gjøres vesentlige endringer i forhold til de opplysninger som er gitt i søknaden, jf. hfl. § 11.

Klageadgang

Du kan klage på komiteens vedtak, jf. forvaltningsloven § 28 flg. Klagen sendes til REK vest. Klagefristen er tre uker fra du mottar dette brevet. Dersom vedtaket opprettholdes av REK vest, sendes klagen videre til Den nasjonale forskningsetiske komité for medisin og helsefag for endelig vurdering.

Med vennlig hilsen

Ansgar Berg
Prof. Dr.med
Komitéleder

Trine Anikken Larsen
førstekonsulent

Kopi til:post@uis.no

Region:	Saksbehandler:	Telefon:	Vår dato:	Vår referanse:
REK vest	Øyvind Straume	55978496	14.01.2016	2015/60/REK vest
			Deres dato:	Deres referanse:
			11.01.2016	

Vår referanse må oppgis ved alle henvendelser

Björg Oftedal
Stavanger

2015/60 Utvikling, utprøving og evaluering av web-basert veiledningsmetode i allmennpraksis for å fremme egenhåndtering av type 2 diabetes

Forskningsansvarlig: Universitetet i Stavanger
Prosjektleder: Björg Oftedal

Vi viser til søknad om prosjektendring datert 11.01.2016 for ovennevnte forskningsprosjekt. Søknaden er behandlet av sekretariatet ved REK vest på fullmakt, med hjemmel i helseforskningsloven § 11.

Vurdering

Ønsket endring

Prosjektendringen innebærer å endre datainnsamlingsmetode fra fokusgruppeintervju til individuelle intervjuer.

REK vest ved sekretariatet vurderte saken.

Vurdering

Vi har ingen innvendinger til ønsket endring.

Vedtak

REK vest godkjenner prosjektendringen i samsvar med forelagt søknad.

Klageadgang

Du kan klage på komiteens vedtak, jf. forvaltningsloven § 28 flg. Klagen sendes til REK vest. Klagefristen er tre uker fra du mottar dette brevet. Dersom vedtaket opprettholdes av REK vest, sendes klagen videre til Den nasjonale forskningsetiske komité for medisin og helsefag for endelig vurdering.

Med vennlig hilsen

Ansgar Berg
Prof. Dr.med
Komitéleder

Øyvind Straume
sekretariatsleder

Kopi til: *post@uis.no*

Appendix 2 – Information letter to patients



Forespørsel om deltakelse i forskningsprosjektet:

«DiaWeb – nettbasert veiledning for personer med type 2 diabetes».

Bakgrunn og hensikt

Dette er et spørsmål til deg om å delta i et forskningsprosjekt om nettbasert diabetesoppfølging i allmennpraksis. Sykepleieren ved ditt fastlegekontor har fått opplæring i en ny veiledningsmetode. Metoden tar sikte på å stimulere til refleksjon om diabetesreguleringen og håndtering av sykdommen i hverdagen. I prosjektet vil vi prøve ut metoden for personer med type 2 diabetes. Hensikten er å få innsikt i hvordan nettbasert veiledning oppleves av den enkelte. Studien er et samarbeid mellom Universitetet i Stavanger og Høgskolen i Bergen, og er hovedsakelig finansiert av Norges Forskningsråd.

Hva innebærer studien?

Som deltaker i studien får du tilbud om nettbasert veiledning relatert til utfordringer du kan møte når du har type 2 diabetes. Det sentrale i denne veiledningsmetoden er bruk av refleksjonsark. Disse vil danne grunnlag for nettsamtaler med sykepleier over en periode på ca. tolv uker. Sykepleieren på ditt fastlegekontor vil kalle deg inn til konsultasjon før oppstart av veiledningen. Du vil bli spurt om å fylle ut et spørreskjema før og etter veiledningsforløpet, samt ta blodprøve for å måle HbA_{1c}. Du vil også bli spurt om å delta i intervju etter avsluttet veiledningsforløp. For utfyllende informasjon om hva deltakelse i studien innebærer, se vedlegg kapittel A.

Mulige fordeler og ulemper

Å delta i en nettbasert veiledning med sykepleier kan innebære flere fordeler for deg. Det kan tilby deg viktig og ny kunnskap om diabetesbehandlingen, gi bedre innsikt og forståelse av forhold som kan påvirke blodsukkerreguleringen, samt styrke håndteringen av sykdommen i dagliglivet. Deltakelse i studien vil innebære at du går gjennom og fyller ut refleksjonsarkene, sender meldinger til din sykepleier og svarer på spørreskjema både før og etter fullført veiledning. For noen kan det gjerne oppleves litt krevende å bruke tid på dette.

Hva skjer med informasjonen om deg?

Opplysninger som registreres om deg skal kun brukes som beskrevet i hensikten med studien. Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En kode knytter deg til dine opplysninger gjennom en navneliste som slettes senest 5 år etter prosjektslutt (31.12.2020). Det er kun autorisert personell knyttet til prosjektet som har adgang til navnelisten og som kan finne tilbake til deg. Alle data blir lagret på universitetets server uten navn eller personopplysninger. Skulle det bli aktuelt med en oppfølgingsstudie på et senere tidspunkt, vil vi kontakte deg med en ny forespørsel om dette. Deltakelse vil være frivillig.

Forskningsprosjektet DiaWeb

Frivillig deltakelse

Det er frivillig å delta i studien. Du kan når som helst og uten å oppgi noen grunn trekke ditt samtykke til å delta i studien. Dette vil ikke få konsekvenser for din videre behandling. Dersom du ønsker å delta, undertegner du samtykkeerklæringen på siste side. Hvis du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte doktorgradsstipendiat Silje Stangeland Lie på tlf. 51 83 16 54 eller mail: silje.s.lie@uis.no, eller prosjektleder Bjørg Oftedal på tlf. 924 61 905 eller mail: bjorg.oftedal@uis.no.

Studien er godkjent av Regional komité for medisinsk forskningsetikk. Ytterligere informasjon om studien (del A) og informasjon om personvern og forsikring (del B), se neste side. Samtykkeerklæring følger etter kapittel B.

Tilbakesending av svar

Samtykkeerklæringen signeres og legges i adressert konvolutt, merket «samtykkeerklæring» og sendes til fastlegekontoret. Du vil etter å ha samtykket til deltakelse få tilsendt brev med innkallelse til første konsultasjon sammen med et spørreskjema som du bes fylle ut på forhånd og sende tilbake i adressert konvolutt, eller ta med og levere på første konsultasjon.

Med vennlig hilsen

Bjørg Oftedal
Prosjektleder/Forsker

Silje Stangeland Lie
Doktorgradsstipendiat

Lege/allmennpraktiker



Kapittel A- utdypende forklaring av hva studien innebærer

Bakgrunn for studien

Type 2 diabetes rammer ca. 3,8 % av befolkningen og beregninger viser at dette tallet vil eskalere de neste årene. Mange som får sykdommen må gjøre livsstilsendringer. Kosthold, mosjon, blodsukker og medisinerer må følges nøye opp av den enkelte for å unngå komplikasjoner. Å gjøre slike livsstilsendringer opplever mange som utfordrende, og forskning viser at de fleste ikke oppnår behandlingsmålene. Det er derfor behov for å styrke helsetilbudet til denne pasientgruppen. Flere offentlige rapporter anbefaler også større bruk av IKT ved behandling og oppfølging av pasienter. Denne studien har derfor utviklet et nettbasert veiledningsprogram for personer med type 2 diabetes som blir behandlet hos fastlegen.

Deltakelse i prosjektet

Deltakelse i prosjektet innebærer at du ved oppstart blir innkalt av sykepleieren til en konsultasjon på fastlegekontoret for å få informasjon om veiledningen, tilgang til nettsiden, samt måle langtidsblodsukkeret. Sykepleieren vil sende deg refleksjonsark via sikre meldinger på MinJournal. Du fyller ut refleksjonsarkene når det passer deg, og din sykepleier responderer. Du blir også bedt om å fylle ut et spørreskjema som dreier seg om hvordan du håndterer din diabetes i dagliglivet, oppfølgingen i allmennpraksis og hvordan du opplever støtten fra helsepersonell før oppstart av behandling. Det samme spørreskjemaet vil også bli sendt til deg etter veiledningen er avsluttet. Da vil du også få spørsmål om hvordan du opplevde den nettbaserte veiledningen. Du vil også bli spurt om å delta i intervju etter fullført veiledning. Det vil ikke være mulig å identifisere deg i resultatene av studien når disse publiseres. I tillegg ber vi om din tillatelse til å innhente opplysninger hos din fastlege om langtidsblodsukker (HbA_{1c}), høyde, vekt og diabetesbehandlingen. Alle opplysningene vil lagres anonymt.

Kriterier for deltakelse

For å kunne delta i studien må du være over 18 år og ha hatt type 2 diabetes i minst tre måneder. Du må kunne kommunisere både skriftlig og muntlig på norsk, og ha tilgang til internett og BankID.



Kapittel B - Personvern, økonomi og forsikring

Personvern

Opplysninger som registreres gjennom det nettbaserte veiledningsprogrammet, samt fra journal vil fastlegekontoret ved behandlende lege være databehandlingsansvarlig for. Opplysninger som du gir gjennom spørreskjemaet, samt opplysninger om langtidsblodsukkeret (HbA_{1c}), høyde, vekt og diabetesbehandlingen vil bli lagret på universitetets server uten navn eller personopplysninger og kun forsker vil ha tilgang til datafilen.

Rett til innsyn og sletting av opplysninger om deg og sletting av prøver

Hvis du sier ja til å delta i studien, har du rett til å få innsyn i hvilke opplysninger som er registrert om deg. Du har videre rett til å få korrigert eventuelle feil i de opplysningene vi har registrert. Dersom du trekker deg fra studien, kan du kreve å få slettet innsamlede opplysninger, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner.

Økonomi og forsikring

Studien er finansiert gjennom Norges forskningsråd, Høgskolen i Bergen, Universitetet i Stavanger og Diabetesforbundet. Forsikring ved deltakelse i studien er basert på Lov om erstatning ved pasientskader mv. (Pasientskadeloven).

Informasjon om utfallet av studien

Resultater fra studien vil bli presentert i ulike nasjonale og internasjonale anerkjente tidsskrifter, samt fagmøter og konferanser. Som deltaker har du rett til å få informasjon om resultatet av studien, og om du ønsker å få tilsendt publikasjoner, kan du kontakte prosjektleder Bjørg Oftedal:

bjorg.oftedal@uis.no. Tlf. 51 83 41 63.

Forskningsprosjektet DiaWeb



Samtykke til deltakelse i studien

Jeg har mottatt og lest informasjon om studien, og er villig til å delta i studien

(Signert av prosjektdeltaker, dato)

Appendix 3 – Information letter to registered nurses

Appendix 3 - Information letter to registered nurses

Forespørsel om deltakelse i forskningsprosjektet:

«DiaWeb: Sykepleieres erfaringer med gjennomføring av nettbasert veiledning for voksne med type 2 diabetes, basert på metoden Guidet Egenbeslutning»

Bakgrunn og formål

Dette er et spørsmål til deg om å delta i en forskningsstudie for å få innsikt i din erfaring med gjennomføring av den nettbaserte veiledningsmetoden Guidet Egen-Beslutning (GEB). Hensikten med veiledningsmetoden er å bidra til bedre mestring av diabetes, herunder evne til problemløsning, kommunikasjon, håndtering av bekymring og symptomer relatert til diabetes. GEB er tidligere testet ut på personer med type 1 diabetes, men det er første gang GEB har blitt prøvd ut i allmennpraksis for personer med type 2 diabetes ved fastlegekontor.

For å få innsikt i erfaringer med å bruke nettbasert GEB blir alle sykepleiere som har fått opplæring i og gjennomført nettbaserte konsultasjoner med bruk av metoden forespurt om å delta i intervju. Hensikten med intervjuene er å utforske erfaringer og utfordringer i prosessen med å gjennomføre nettbasert veiledning for voksne personer med type 2 diabetes i allmennpraksis.

Hva innebærer deltakelse i studien?

Deltagelse i studien innebærer å delta i individuelle intervju etter gjennomføring av nettbasert veiledning basert på GEB metoden. Intervjuene vil ha form som en samtale og dreie seg om erfaringer og utfordringer med å gjennomføre nettbaserte konsultasjoner med bruk av GEB som veiledningsmetode. Samtalene vil bli tatt opp på lydbånd, vil ta inntil en time og vil finne sted i løpet av april 2017.

Hva skjer med informasjonen om deg?

Alle personopplysninger vil bli behandlet konfidensielt. For å sikre konfidensialitet vil data lagres på Universitetet i Stavanger sin forskningsserver. Samtalene blir transkribert og anonymisert, slik at det ikke er mulig å spore enkeltutsagn tilbake til den enkelte, og enkeltpersoner vil ikke kunne gjenkjennes når resultatene blir publisert. Lydbåndopptakene slettes når prosjektet avsluttes, i løpet av 2019.

Frivillig deltakelse

Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn. Dersom du trekker deg, vil alle opplysninger om deg bli anonymisert. Dersom du ønsker å delta, undertegner du samtykkeerklæringen på neste side. Om du nå sier ja til å delta, kan du senere trekke tilbake ditt samtykke. Dersom du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte prosjektleder Bjørg Oftedal på tlf. 924 61 905 eller mail: bjorg.oftedal@uis.no, eller doktorgradsstipendiat Silje Stangeland Lie på tlf. 975 06 752 eller mail: silje.s.lie@uis.no.

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og er villig til å delta

(Signert av prosjektdeltaker, dato)

Appendix 4 – The web-page MinJournal.no

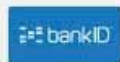
The user interface of the web page and the secure messaging system is illustrated in the following pictures. Picture 1 shows the main web page, Picture 2 shows the login options, and Picture 3 shows the user interface of the secure messaging system.



Picture 1 The web page www.minjournal.no



VELG ELEKTRONISK ID



BankID

Med koder fra banken din



Buypass

Med smartkort og kortleser



Commfides

Med USB-pinne



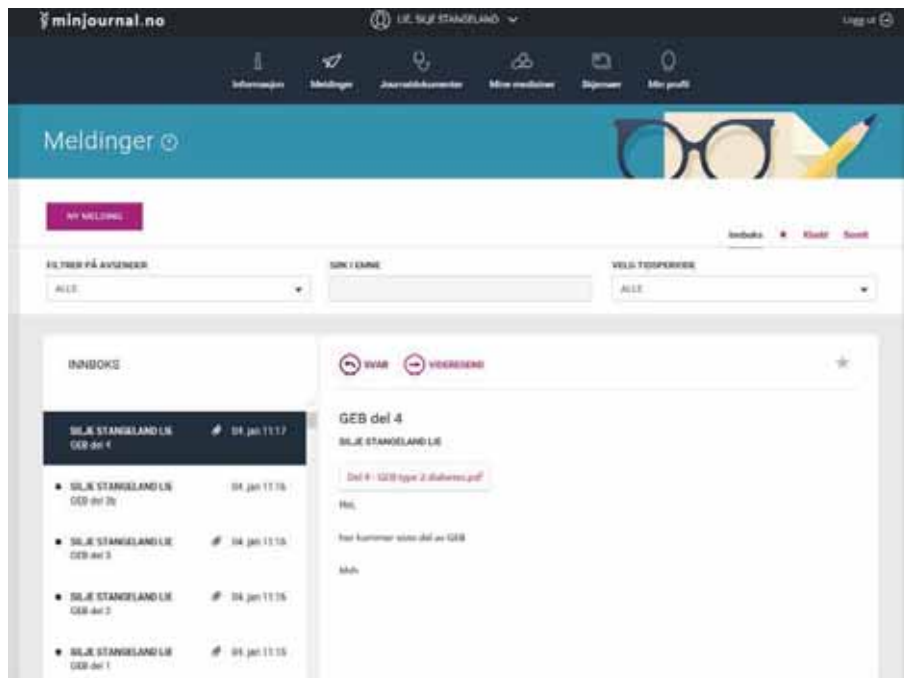
BankID på Mobil

Med sikker legitimasjon på mobil

[Slik skaffer du deg elektronisk ID](#)[Kontaktskjema](#) | Tlf: 800 30 300 | [Hjelp til innlogging](#) | [Sikkerhet og personvern](#)

Driftet av Direktoratet for forvaltning og IKT (Difø)

Picture 2 Login options



Picture 3 The secure messaging system

Appendix 5 – The eGSD reflection sheets



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Refleksjonsark til E-konsultasjon 1

Ditt liv med diabetes

- 1.a. Viktige begivenheter og perioder i ditt liv med diabetes
- 1.b. Hva synes du for tiden er utfordrende, vanskelig eller skaper bekymring ved å skulle leve med diabetes?
- 1.c. Ufullstendige setninger om verdier, erfaringer og behov
- 1.d. Metafor eller beskriv hvordan det er for deg å leve med diabetes





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1. a Viktige begivenheter & perioder i ditt liv med diabetes

Angi **årstallet** du fikk diabetes

Angi start - og sluttidspunkt for lengre **perioder** der

din diabetes har vært velregulert (skriv V på linjen)

du har vært plaget med svingende blodsukker (skriv S på linjen)

blodsukkerverdiene dine har vært for høye (skriv H på linjen)

du har vært plaget med lave blodsukkerverdier (skriv L på linjen)

du har vært plaget med komplikasjoner (skriv K på linjen)

du har vært plaget med bivirkninger av medisiner (skriv B på linjen)

Fyll inn i aktelle felt. (se eksempel på neste side)



Angi det du selv mener har påvirket reguleringen positivt eller negativt:

F.eks. følelser og reaksjoner; begivenheter; opplevelser hjemme, på jobben/skolen eller fritiden; andre forhold som f.eks. medisin (se eksempel på neste side)



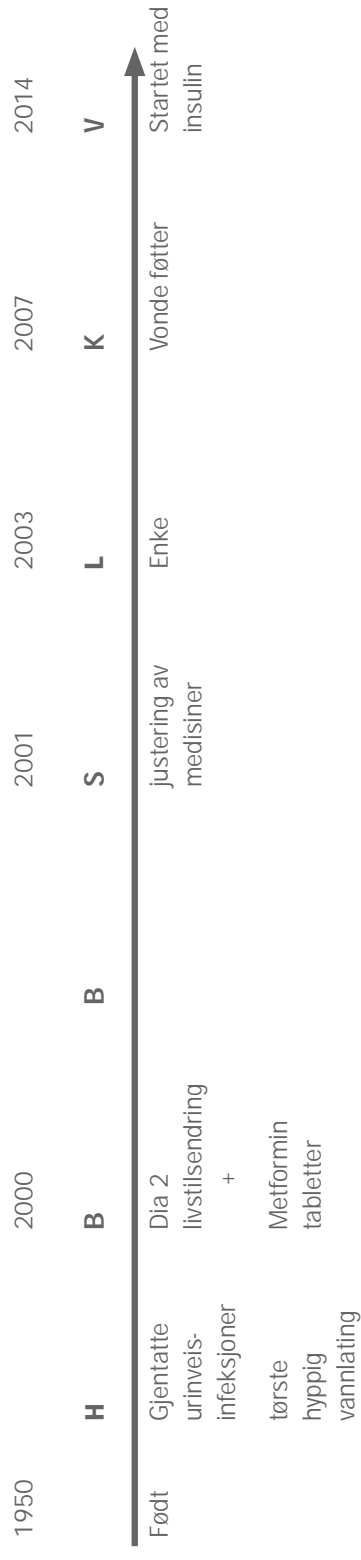
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Eksempel på person med type 2 diabetes.

“Viktige begivenheter og perioder i ditt liv med diabetes”





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1b. Hva synes du for tiden er utfordrende, vanskelig eller skaper bekymring ved å skulle leve med diabetes?

Skriv noen stikkord:



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1c. Ufullstendige setninger - om *verdier, erfaringer og behov*

Skriv i feltet under

De som kjenner min måte å leve på, synes at jeg ...

Det jeg er best til når det gjelder min diabetes, er ...

Det verste ved å ha diabetes er ...

Det jeg er dårligst til, er ...

Min diabetes har hindret meg i ...

Den får ikke hindre meg i ...

Om ett år vil jeg....

Jeg bør ikke gi min diabetes skylden for ...

Når jeg skal til legekontolet for min diabetes, tenker jeg ...

Jeg vil gjerne lære mer om ...

Når jeg måler blodsukker, er det fordi ...

Noe som kan gi problemer hjemme, er ...



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Jeg synes at mine kollegaer/ venner...

Noe jeg prøver å forandre ved meg selv, er...

En vane jeg har vanskelig for å slutte med, er ...

For å regulere min diabetes velger jeg å ...

Jeg synes det er vanskelig å motstå press fra ...

Jeg får god støtte av ...

Jeg får for lite støtte av ...

Min diabetes har lært meg ...

Den lykkeligste dagen i mitt liv var da ...

Den tristeste dagen i mitt liv var da ...

Det jeg ønsker meg aller mest, er ...

Når jeg blir gammel, vil jeg gjerne kunne se tilbake på at jeg har ...



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**1d. Bruk en metafor og/eller beskriv hvordan
det er for deg å leve med diabetes.**

(Du kan også tegne et bilde som du scanner og legger ved som et ekstra vedlegg i meldingen.)

Skriv:



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Refleksjonsark til E-konsultasjon 2

Endringsfokus

- 2a. Plassen diabetes har i ditt liv
- 2b. Planer for endring av levevaner





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2a. Plassen diabetes har i ditt liv

Så mye har min diabetes fylt
fram til nå:

Så mye skal min diabetes fylle
framover:

Bruk "x" eller et et valgt tegn for å fylle feltene

Hva består forskjellen i?
(skriv tekst i feltet under)



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2b Planer for endring av levevaner

Mye av det som anbefales i livet med diabetes kan være vanskelig å tilpasse hverdagen.

Sett kryss i venstre kolonne ved de setningene du synes passer på din hverdag.

Marker med kryss i kolonnene til høyre om det er noe du vil endre på eller fortsette med.

Følgende kjennetegner min hverdag (sett hake)		Jeg vil endre på det: (sett hake)			Jeg har ikke planer om å endre det.
		I løpet av den første måned	I løpet av det første halve året	Etter det første halve året	
	Jeg spiser for mye				
	Jeg mangler kunnskap om hvilken mat som er hensiktsmessig for meg å spise				
	Jeg mosjonerer ikke jevnlig				
	Jeg mosjonerer ikke nok til å få pulsen til å stige				
	Jeg beveger meg for lite i det daglige				
	Jeg lar av og til være å ta den medisinen som er ordinert for meg				
	Jeg vet ikke nok om type 2 diabetes og dens komplikasjoner				
	Jeg veier for mye				
	Jeg røyker				
	Jeg glemmer å undersøke og stelle mine føtter som anbefalt				
	Jeg er usikker på hvordan alkohol påvirker min diabetes				
	Jeg har problemer i forbindelse med inntak av alkohol/rusmidler				
	Jeg har ikke vært hos øyelege de siste to årene				
	Jeg tar ikke blodsuktermålinger som anbefalt				
	Jeg har ikke satt mitt eget mål for hva min HbA1c (langtidsblodsukker) skal være				
	Jeg har problemer i forhold til igangsatt insulinbehandling				
	Jeg har avslått forslaget om insulinbehandling				
	Annet:				



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3a. Presisering av utfordring/problem du ser i ditt liv med diabetes

Lister over det som er utfordrende/vanskelig. Sykepleierens settes inn etter din liste. Kan gjerne være forskjellige:

Din liste: Du har fylt denne ut hjemme

Skriv her:

Sykepleierens liste:

Påføres under e-konsultasjon 3

Skriv her:

Ønskes forandret:

Vår felles presisering av noe som med fordel kan forandres eller øke din kapasitet til å håndtere diabetes

Formuleres på en måte som du er enig i og som vi begge synes er dekkende.

Dette fyller du og sykepleier ut i fellesskap på legekontoret på den 3dje konsultasjonen



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Refleksjonsark til E-konsultasjon 3a

Forandringsarbeid

3a. Presisering av problem/utfordring. Hva kan vi enes om er utfordringer eller problemer i ditt liv med diabetes





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3a. Presisering av utfordring/problem du ser i ditt liv med diabetes

Lister over det som er utfordrende/vanskelig. Sykepleierens settes inn etter din liste. Kan gjerne være forskjellige:

Din liste: Du har fylt denne ut hjemme

Skriv her:

Sykepleierens liste:

Påføres under e-konsultasjon 3

Skriv her:

Ønskes forandret:

Vår felles presisering av noe som med fordel kan forandres eller øke din kapasitet til å håndtere diabetes

Formuleres på en måte som du er enig i og som vi begge synes er dekkende.

Dette fyller du og sykepleier ut i fellesskap på legkontoret på den 3dje konsultasjonen



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Refleksjonsark til E-konsultasjon 3b og 3c

Forandringsarbeid

3b. Utfordring eller problem som så langt har vært sentralt

- Dine observasjoner
- Dine tanker og følelser
- Dine mål og intensjoner
- Dine handlinger

3c. Dynamisk problemløsning.





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3b. Utfordring eller problem som så langt har vært sentralt:

Det som er vanskelig og utfordrende er:

Dine observasjoner

Hvor lenge har du opplevd det?

Hvor ofte opplever du det?

Har det blitt større eller mindre med tiden?

Når merker du det mest?

Når merker du det minst?





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Dine tanker og følelser

Hva tror du at utfordringen eller problemet henger sammen med?

Hva gjør det verre?

Hva gjør det bedre?

Hva hindrer det deg i?

Hva oppnår du med det?

Hvor mye påvirker det deg?



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Dine mål og intensjoner

Hva er viktig for deg? Hva ønsker du å oppnå?

Hva kan du eller andre vinne ved at utfordringen mestres eller problemet løses?

Hva kan du eller andre tape ved at utfordringen mestres eller problemet løses?

På lang sikt?

På kort sikt?

På kort sikt?

På lang sikt?

Har du bestemt deg for å mestre utfordringen eller løse problemet helt eller delvis?

Hvis delvis – hvilke deler?



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Dine handlinger

Hva har du hittil klart når det gjelder å mestre utfordringen eller løse problemet?

Når?

Hvor ofte?

Hva har du gjort uten å få det til?

Hvem har du fått hjelp av?

Hvem har du savnet hjelp fra?

Hvem har du bedt om hjelp?

Hvem skulle du gjerne ha bedt om hjelp fra?



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Dine observasjoner

3c Dynamisk problemløsning

Fremtidsrettet problemløsning

Dine mål og intensjoner

Problemløsning så langt	
Dine tanker og følelser	Dine handlinger

Utfordringen eller problemet:



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Refleksjonsark til E-konsultasjon 4

Forandringer i hverdagen

- 4a. Blodsuktermålinger og dine grunner for å måle
- 4b. Nye strategier og langsiktig plan
- 4c. Plan for det du vil forandre på kort og lang sikt
- 4d. For og imot





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4a. Blodsuktermålinger og dine grunner for å måle det

Marker med én eller flere bokstaver det som svarer til dine grunner for hver blodsuktermåling.

- A – avtale
- H – for å oppdage høye blodsukerverdier
- L – forebygge eller oppdage lave blodsukerverdier
- N – av nysgjerrighet
- V – for å bygge opp en god vane
- M – for min egen skyld
- HP – for helsepersonellets skyld

Legg eventuelt til en bokstav som passer for deg

Bruk dato- og klokkeformatet dd/mm-yy, og 00:00

Dato	Klokkeslett	Blodsukker-verdi	Hvilken situasjon var jeg i?	DINE grunner for å måle

Glukose	5	6	7	8	9	10	11	12	13	14	15	16	17	18	mmol/l
HbA1c	5,4	5,5	6	6,7	7,3	7,9	8,5	9,2	9,8	10,4	11,1	11,7	12,3	12,9	%



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4b. Nye strategier og langsiktig plan

Hva har du oppnådd til nå?

Har du et mål med din diabetes som er oppnåelig og i så fall, som føles viktig og meningsfull for deg?

Kommentarer til egne mål

Hva skal til for å holde prosessen i gang?

Hvem kan være til hjelp i den videre prosessen?



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4.c. Plan for det du vil forandre på kort og lang sikt.

Kortsiktige og langsiktige mål

Det du vil forandre:

Slik du ønsker at fortsettelsen skal være

Bruk datoformatet dd/mm-yy

Dato		Dato		Dato	
Mitt mål:	Dette klarte jeg:	Mitt mål:	Dette klarte jeg:	Mitt mål:	Dette klarte jeg:

Dato		Dato		Dato	
Mitt mål:	Dette klarte jeg:	Mitt mål:	Dette klarte jeg:	Mitt mål:	Dette klarte jeg:



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4.d For og imot

Fylles kun ut ved behov

Veldig bra	
Bra	
Mindre bra	
Dårlig	

Originalkilde: E.Aborelius

Appendix 6 – Interview guide for paper I

Intervjuguide telefonintervju frafall

1. Kan du fortelle om dine erfaringer med nettbasert veiledning, før du sluttet?
2. Når og hva var årsaken til at du valgte å trekke deg?
3. Hva var dine forventninger?
 - a. Hvordan skulle dette vært utformet for at det skulle vært aktuelt for deg?
4. Hvordan opplevde du å kommunisere skriftlig med din sykepleier via nettsiden?
5. Helt til slutt; Er det noe som du har lyst å snakke om som jeg ikke har spurt om?

Appendix 7 – Interview guide patients paper II and III

Intervjuguide individuelle intervju, pasienter som fullførte intervensjonen

Innledende spørsmål:

Fortell litt om deg selv; alder, hva du gjør, og hvor lenge du har hatt type 2 diabetes

Hovedspørsmålet:

Du er en av de første som har prøvd denne internett-oppfølgingen. Kan du fortelle hvordan du opplevde det å delta i dette?

Underspørsmål

1. Kan du fortelle om hvordan du har opplevd å fylle ut refleksjonsarkene?
2. Hvordan opplevde du denne måten å skrive ned dine tanker, følelser og planer for endring, og få svar fra sykepleieren sammenlignet med slik du tidligere har blitt fulgt opp?
 - a. Hvordan opplevde du at det å skrive refleksjoner påvirket motivasjonen din ift å håndtere diabetes?
 - b. Hvordan opplevde du at det du hadde skrevet i refleksjonsarkene påvirket det du kommuniserte om med sykepleier?
 - c. Hvordan opplevde du å bli møtt av sykepleieren gjennom internett-oppfølgingen?
 - i. Hvordan påvirket intervensjonen forholdet deres?
 - d. Har det å fylle ut alle disse arkene og få respons fra sykepleier lært deg noe? Eksempler?
3. (*Spørsmål kun til deltakerne i 'blended' eGSD*) Hvordan opplevde du det å møte sykepleieren for å snakke om noen av arkene (nr 3), etter å ha kommunisert skriftlig?
 - a. Hva betydde dette møtet for forholdet deres?

Oppsummert:

Etter at du har deltatt i denne nettbaserte veiledningen, har du noen kommentarer eller forslag til forbedringer? Helt til slutt, er det noe jeg ikke har spurt om som du har lyst å si noe om?

***Appendix 8 – Interview guide registered nurse
interviews, paper III***

Intervjuguide individuelle intervju med studie-sykepleierne

Innledning:

Alder? Hvor lenge jobbet m/ diabetesoppfølging? Utdanning? Kurs?

Hovedspørsmål:

Fortell om dine erfaringer med å gjennomføre Guidet egen-beslutning (GEB) veiledning via internett for pasienter med type 2 diabetes.

Tilleggsspørsmål:

1. Hvordan opplevde du å rekruttere pasienter til veiledningen?
2. Hva tenker du er grunnen til at pasienter ikke ønsket å delta / evt. droppet ut?
3. GEB veiledningen har vært en kombinasjon av nettbasert og konsultasjon på legekontoret. Hvordan har du opplevd denne kombinasjonen?
 - a. Den 3dje konsultasjonen var på legekontoret: Hvordan opplevde du denne samtalen?
4. Hva mener du er den største forskjellen mellom ordinær oppfølging og GEB veiledningen på nettet?
5. Hvilken betydning har nettbasert veiledning hatt for ditt møte med pasientene?
6. Hvordan opplevde du relasjonen mellom deg og pasienten når du veiledet via nettet?
7. Fortell om hvordan du opplevde prosessen med å kommunisere og respondere skriftlig til pasienten?

Oppsummert:

- Dersom du skulle brukt denne metoden videre, hva ville du sagt var viktig å videreføre eller gjøre annerledes?
- Er det noe som du tenker på som ikke har kommet frem i denne samtalen?

***Appendix 9 – Consolidated criteria for reporting
qualitative studies (COREQ): 32-item checklist***

No	Item	Question	Answer	Reported in
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Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist by Tong et al., 2007

Domain 1: Research team and reflexivity				
Personal characteristics				
1	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Thesis author	Papers and thesis
2	Credentials	What were the researcher's credentials? E.g. PhD, MD	MSc	All papers
3	Occupation	What was their occupation at the time of the study?	Doctoral candidate	Papers and thesis
4	Gender	Was the researcher male or female?	Female	Not reported other than by name
5	Experience and training	What experience or training did the researcher have?	Novice	Thesis: strengths and limitations
Relationship with participants				
6	Relationship established	Was a relationship established prior to study commencement?	Patients: no RNs: yes	Thesis: presented under subheading data-collection
7	Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the	Patients had some knowledge, as interviewer presented herself. RNs had	Thesis: Presented under subheading

No	Item	Question	Answer	Reported in
		research	good knowledge about interviewer	strengths and limitations
8	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Background and pre-understanding	Thesis: Stated in preface and in the sub-heading Pre-understanding
Domain 2: Study design				
Theoretical framework				
9	Methodological orientation and Theory	What methodological orientation was stated to underpin the study?	Qualitative interpretive approach, and self-determination theory as theoretical background	Thesis: Stated in theory and methods chapters
Participant selection				
10	Sampling	How were participants selected?	RNs: Purposive sampling Patients: Recruited by RNs according to inclusion criteria	Thesis: Stated in Participants chapter
11	Method of approach	How were participants approached?	RNs: asked verbally by project leader or PhD candidate	Thesis: Stated in Participants chapter

No	Item	Question	Answer	Reported in
			Patients: Asked verbally or by invitation letter by own RNs or GP	
12	Sample size	How many participants were in the study?	Reported in all three papers	Thesis: Stated in Participants chapter
13	Non-participation	How many people refused to participate or dropped out? Reasons?	reported	Reported in paper I and in thesis under subheading strengths and limitations
Setting				
14	Setting of data-collection	Where was the data collected?	Qualitative interviews by telephone, at a meeting room at the university or at the GP	Reported in all three papers
15	Presence of non-participants	Was anyone else present besides the participants and researchers?	no	Not reported
16	Description of sample	What are the important characteristics of the sample?	reported	In all papers and in thesis under sub-

No	Item	Question	Answer	Reported in
				heading participants
Data collection				
17	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	yes	Reported in thesis under subheading dependability and confirmability and interview guides are provided in appendices 6-8
18	Repeat interviews	Were repeat interviews carried out? If yes, how many?	no	-
19	Audio/visual recording	Did the research use audio or visual recording to collect the data?	yes	Reported in all papers
20	Field notes	Were field notes made during and/or after the interview or focus group?	yes	Not reported
21	Duration	What was the duration of the interviews or focus group?	reported	Reported in all papers
22	Data saturation	Was data saturation discussed?	no	-

No	Item	Question	Answer	Reported in
23	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	no	-
Domain 3: analysis and findings				
Data analysis				
24	Number of data coders	How many data coders coded the data?	Doctoral candidate	Reported in thesis in table 3
25	Description of the coding tree	Did authors provide a description of the coding tree?	no	-
26	Derivation of themes	Were themes identified in advance or derived from the data?	Data-driven	Reported in thesis under subheading qualitative content analysis
27	Software	What software, if applicable, was used to manage the data?	Word and NVivo	Not reported
28	Participant checking	Did participants provide feedback on the findings?	no	-
29	Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	yes	Reported in each paper

No	Item	Question	Answer	Reported in
30	Data and findings consistent	Was there consistency between the data presented and the findings?	yes	Illustrated in each paper by presenting quotations
31	Clarity of major themes	Were major themes clearly presented in the findings?	Yes	Themes and sub-themes/categories are presented in each paper, representing diverse experiences with the eGSD
32	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	yes	