BECOMING YOUR BEST FRIEND:
DESIGNING SELF-REFLECTION TOOLS FOR PATIENTS WITH TYPE 2 DIABETES

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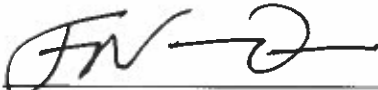
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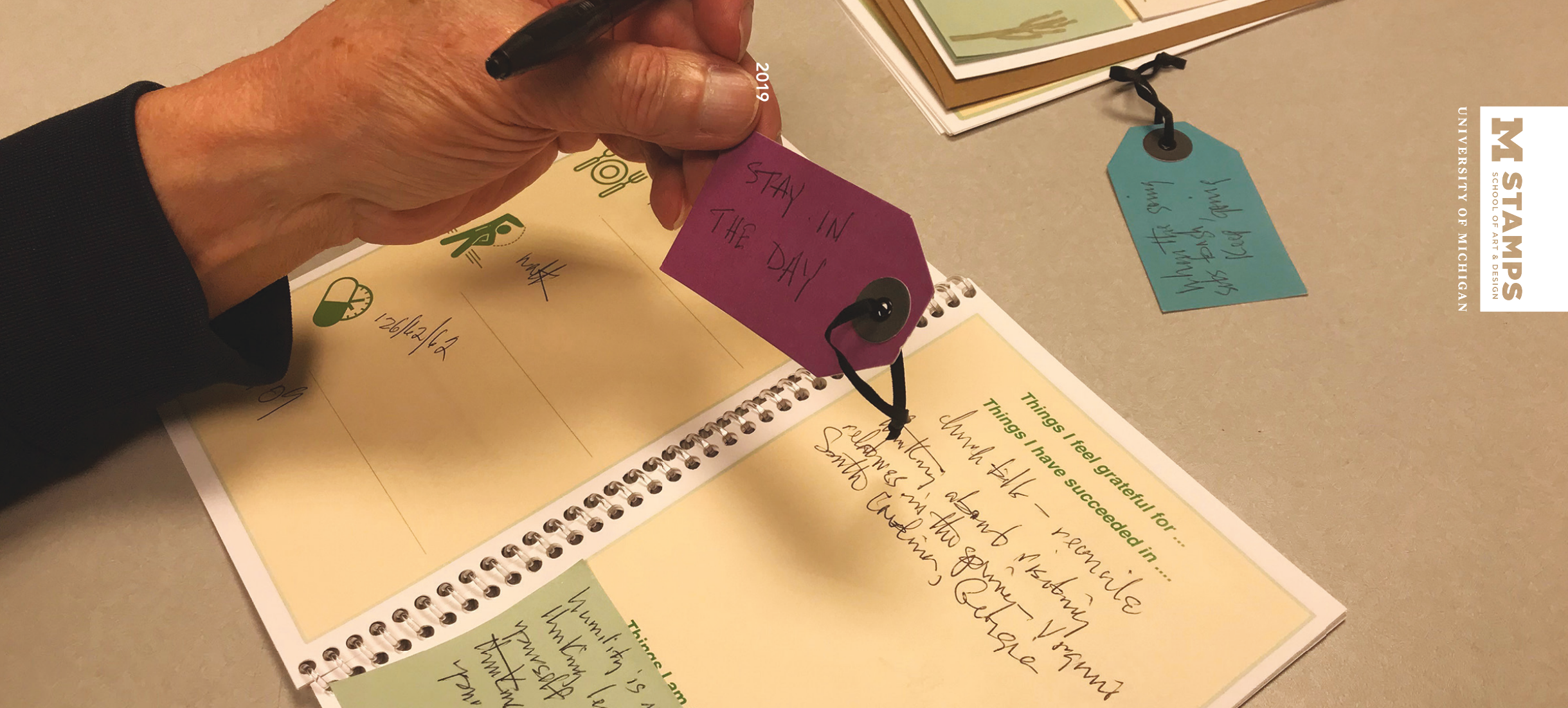Elona Van Gent, Associate Dean for Academic Programs

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APPROPRIATE CARE

Becoming your own best friend: Designing self-reflection tools for patients living with Type 2 Diabetes

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Spring 2019

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BECOMING YOUR OWN BEST FRIEND: DESIGNING SELF-REFLECTION TOOLS FOR PATIENTS LIVING WITH TYPE 2 DIABETES

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Through their tireless efforts, I learned a great deal about humility and openness and how to become bridge-builder in society. In sum, all that I learned and come to realize outside the department became inspiration for my thesis project, making me think carefully about the meaning of my work and helped me search for a way to share what I have learned at school. For it is not something for me to keep to myself, but a blessing to be shared.

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Contents

Abstract

This thesis project explores how design can initiate self-reflection among patients with Type 2 Diabetes and how this reflection might affect their motivation for diabetes self-management. This thesis describes the design process of creation and implementation of self-reflection tools and how a designer can deepen the understanding of problems space and discover the insight through building empathetic relationships with patients. Finally, it presents major findings that can provide implications about diabetes self-management such as increasing problem-solving skills in diabetes management and facilitating new thinking patterns about what is important and meaningful in patients' lives, which can help sustain long-term motivation.

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INTRODUCTION

Project context and rationale

Type 2 Diabetes (T2D) is increasingly prevalent in the US. It is reported that 9.4 percent of the population has diabetes and 26.3 percent have pre-diabetes, a condition that, if not treated, often leads to T2D within five years. T2D also causes a considerable financial burden on patients. Average medical expenditures among people with diagnosed diabetes are 2.3 times higher than what expenditures would be in the absence

of diabetes (Centers for Disease Control and Prevention 2017). Total annual costs of diagnosed diabetes in the U.S is $327 billion, and it has increased by 26 percent compared to 5 years ago (Centers for Disease Control and Prevention 2017). One of the challenging aspects of the disease is that it is a life-long, 24 hour-a-day disease and the outcome of its treatment is mostly determined by patients' health behaviors including a dietary regimen, engagement in consistent physical activity and maintenance of a good blood glucose level. This makes self-management the cornerstone of diabetes care. However, it is difficult for many patients with T2D to practice self-management consistently. For example, the 2016 National Health and Nutrition Examination Survey (NHANES) data show that 45 percent of patients with diabetes have not achieved the normal range of Hemoglobin A1c levels, a blood test showing the average blood sugar levels.

One major barrier to maintaining the normal range of levels is that self-management of diabetes is an iterative, continuous task associated with considerable stress and distress. Patients often feel tired and overwhelmed by ongoing diabetes management, and this is known as diabetes burnout (Fritschi, Quinn 2010) or treatment fatigue (Heckman, Mathew, Carpenter 2015). For this reason, it has been well recognized in the literature (e.g., Shigaki et al. 2010) that strengthening and sustaining diabetic patients' motivation is the key to successful diabetes management. In other words, intervention for helping those patients to keep on track with their self-management is critical because it eventually leads to better health outcomes with their more active engagement.

Research question and objectives

This thesis positions itself in the problem space of self-management

of patients with T2D. In this thesis, I plan to explore how design can increase diabetic patients' motivation through the creation and implementation of self-reflection tools. The research questions I address in my thesis are:

How might we design self-reflection tools that can support people with Type 2 Diabetes to increase their motivation and engage in diabetes management more actively?

How might we support patients to maintain their interest in a daily practice of self-reflection over time by helping them develop a meaningful association with the practice?

The hypothesis underlying the research question is that self-reflection tools can allow patients to pause amid their busy life and reflect on their daily lives. In doing so, they can discover aspects of their lives they have not previously been aware of. A study by Feste (1992) shows that this self-awareness is a critical element of diabetes management as it empowers patients to be more aware of themselves and better informed about diabetes, thereby enabling them to make better choices to manage their diabetes. This view is embraced by both my thesis advisor, Caroline Richardson, MD, and social worker, Anna Konigsberg, MSM, who works with diabetes patients at Michigan Medicine. They mentioned that reflection affects awareness and commitment to diabetes self-management since it helps to maintain individuals' focus on their diabetes self-management and they can learn from their own experience.

Another hypothesis underlying the importance of self-reflection is that design can have an impact on enhancing patients' engagement in using self-reflection tools. The director of diabetes education at Metabolism, Endocrinology & Diabetes (MEND) of Michigan Medicine,

pointed out during an interview that creating an "enjoyable" experience of being involved in self-management is an essential part of diabetes management. It is believed that human-centered design research methods, such as active listening to people and iterative prototyping based on stakeholders' feedback on their experience and emotions, provides the potential for design to make a difference to create a more customized and engaging experience (Clark and Smith 2008).

LITERATURE
REVIEW

To address the research question posed above, four areas of literature are reviewed: 1) diabetes and self-management, 2) self-determination and autonomous motivation, 3) self-reflection, awareness and learning, and 4) meaningful association between a user and an object. The first three areas are focused on the importance of patient engagement in the process of healthcare and the last area on what a design approach can offer in the process.

Diabetes and self-management

Diabetes is a progressive and long-term illness (WHO 2017). Patients with diabetes need to make decisions and take actions daily to effectively manage their diabetes; thus, self-management is a critical part of diabetes care (Funnel, Anderson 2002). Self-management is defined as "an individual's ability to manage the symptoms, treatment and physical and psychological consequences and lifestyle changes inherent in living with a chronic condition" (Barlow et al. 2002, 178). Diabetes self-management is also regarded as an ongoing process of gaining the knowledge, and of acquiring the relevant skills and ability necessary for diabetes self-care (Haas et al. 2014). This requires behavioral health changes such as healthy eating, regular physical exercise, blood glucose monitoring, and medication in the context of daily life events (Funnel 2007). Patients themselves need to play a crucial role in managing their illness to achieve optimal health outcomes. Hortensius et al. (2012) argue that blood sugar control can be both "friend" and "foe" for diabetic patients depending on how patients engage in the management of blood glucose, showing the importance of the patients' role in managing their diabetes.

Many studies have shown that the main health issues faced by people with diabetes are the deterioration of glycemic control and related complications such as cardiovascular disease, nerve damage (neuropathy), kidney damage (nephropathy), eye damage (retinopathy). Therefore, one of the main goals for diabetes manage-ment is to maintain optimal glycemic control and prevent complications, and to this end, it is vital for patients to be involved in their treatment and self-care (Sousa et al. 2004). For this reason, self-care behaviors of patients are also used as standard diabetes quality indicators (Glasgow et al. 2008).

Despite this significance, achieving optimal self-management is challenging for many patients with T2D (Heinrich, Schaper and Vries,

2010). For instance, 45 percent of patients with diabetes have not achieved the normal range of Hemoglobin A1c levels (National Health and Nutrition Examination Survey 2016), which indicates average blood glucose (blood sugar) control for the past two to three months (American Diabetes Association). Therefore, the need for developing effective intervention of diabetes self-management which patients can adopt and use in the long-term has been recognized as the most critical in diabetes management and care.

Self-determination and autonomous motivation

Self-determination theory is a theory of human motivation applied to a variety of areas including healthcare, education, work, and sport (Deci and Ryan 2008). This theory is known as the theory of motivation that explicitly identifies autonomy as a human need that, when supported, facilitates more autonomous forms of behavioral regulation. According to this theory, autonomous motivations have been associated with the positive effect of interest and enjoyment (Deci and Ryan 1985; Reeve 1989). That is, people are autonomously motivated when they have a sense of enjoyment and interest in specific activities and when they value them for their own reasons. By contrast, controlled motivation involves people behaving in a certain way due to external demands or threats (e.g., from a healthcare provider or family members). Controlled, motivated people also behave in a certain way to avoid shame or guilt. (Sheldon, Williams, and Joiner 2003). Studies show that autonomous motivation is positively related to adjustment outcomes such as achievement, whereas controlled motivation has a negative association with the same outcomes (Deci and Ryan 2002; Vallerand 1997). This theory is also held concerning personal meaning. A study by

Deci, Eghrari, Patrick, and Leone (1994) shows that individuals, on their own, tend to be more autonomously motivated to develop the necessary skills and ability on their own to regulate their behaviors when they see those behaviors as personally meaningful.

The importance of autonomously motivated behavior is also supported in a clinical setting. It is found to improve treatment adherence (Williams et al. 1998) and bring a positive influence on treatment outcomes in dealing with various health issues such as diabetes, alcohol use, and smoking (Ryan, Plant, and O'Malley 1995; Williams, Freedman, and Deci 1998; Williams et al. 2001; Williams et al. 1996). Besides, Zuroff et al. (2007) argue that this autonomous motivation in treatment can be considered a new predictor of treatment outcomes. In the context of diabetes management, autonomous motivation can be developed when patients feel they are facilitating and seeing the value in specific diabetes self-management behaviors (Williams et al. 1996; Williams et al. 1998). Motivation is an important conceptual variable in diabetes regimen adherence. Senecal, Nouwen, and White (2000)'s study also suggests that perceptions of autonomy underlie effective diabetes self-management and thus can result in better glycemic control.

Self- reflection, self-awareness, and learning

One of the critical elements in diabetes self-management is reflection. Reflection and reflective practice are considered a close examination of one's thoughts and behaviors, learning from experience and an experimental disposition towards ongoing activity (Aujoulat, Hoore, and Deccache 2007). It is suggested that an act of expression on experience through reflection can help patients with diabetes develop the skills necessary for an adequate self-management of

diabetes (Karlsen, Oftedal, and Lie 2016). One important aspect of reflection is the creation of new understanding. Gadamer (1989) argues that new understanding is initiated and facilitated through reflection and this happens through the integration of new experiences and previous understanding. In a healthcare setting, a study by Hörnsten et al. (2011) suggests that reflection can contribute to increasing the awareness of patients and helping patients take responsibilities for their health
management. In the study, learning through reflection occurred when the participating patients integrated the illnesses and change in their body with a new understanding of seeing themselves as an individual.

Written expression is one of the effective tools to facilitate reflection. Many studies have demonstrated the positive effect of using writing to enhance the outcome of medical treatment and increase quality of life across diverse populations, including college students who suffer from depression, patients with cancer, as well as individuals with chronic pain and a variety of physical illnesses (Murali, Fernbach, and Potocki 2014; Furnes and Dysvik 2012; Gortner, Rude, and Pennebaker 2006; Manzoni, Castelnuovo, and Molinari 2011). It is also suggested that expressing individual experiences related to diabetes management can empower patients to become more self-determined and this, in return, helps them develop the self-care skills needed to manage diabetes. (Karlsen, Karlsen, and Karlsen 2016). The reason is that written reflection enables individuals to translate their emotions and experiences into words, so they can be more aware of the different types of situations they are facing while going through the cognitive process (Pennebaker and Chung 2007).

Designing meaningful association between users and objects

In exploring how the relationship between users (e.g., patients) and objects (e.g., the design interventionfor self-reflection) can be developed, product attachment perspectives are reviewed. Product attachment has been studied on why and how people develop their relationship with their belongings and many studies in product attachment have shown the association that people assign to their possession. That is, an object can have a meaning for its bond to appreciable memories, experiences, people, places or values. Csikszentmihalyi and Rochberg-Halton (1981) describe this "meaning making" as the cause of product attachment. Other studies also suggest that people become more attached to a product for the personal and special meaning the product delivers (Csikszentmihalyi and Rochberg-Halton 1981; Wallendorf and Arnould 1988).

The topics such as memory, enjoyment and time in product attachment theory are also related to self-reflection tools for diabetes self-management. According to Mugge et al. (2005), memories cultivated through interactions with a product influence user experience and strength of attachment. Mugge (2007) also discovered that the enjoyment of using a product could be enhanced as the memories related to a certain product has accumulated. She goes on to say that the attachment people hold toward a product tends to be increased when there are marks and scratches on the product. These marks and scratches imply the time spent by users and reinforce the relationship between the product and the user (Schifferstein and Zwartkruis-Pelgrim 2008). There are also studies that examine product attachment in relation to time. Myers (1985) states that the strength of the attachment felt by an individual towards an object tends to change over time and a user's experience of attachment gradually develops as the user and the product interact with each other in multiple times.

In sum, studies on the significance of meaningful self -involvement in disease management described above all point out the importance of autonomy and motivation as it can genuinely bring changes in people's behaviors. In terms of designing helpful tools for individuals to be involved in a meaningful process, studies in various fields have been reviewed to see how the association between a user and an object can be created and built through time and attachment.

METHODOLOGY

Double Diamond Design Methodology

Buckley and Chiang (1976) define research methodology as "a strategy or architectural design by which the researcher maps out an approach to problem-finding or problem-solving." This thesis project explores how we might design self-reflection tools that can support people with Type 2 Diabetes to increase their motivation and engage in diabetes management more actively. The framework adopted is "double

diamond design." Double diamond design is "a simple visual map of the design process" created by the Design Council in the UK (Design Council) and involves two different types of thinking: 1) divergent thinking involves thinking broadly and maintaining an open-mindset and 2) convergent thinking involves thinking narrowly and focusing on one or two main problems and solutions. This design mode has four phases: Discover, Define, Develop and Deliver and are described below:

- Discover: Exploring different aspects and variables that influence the problem space and its possible solutions.

- Define: Identifying specific insights leading to framing the problem.

- Develop: Creating concepts and prototypes to generate possible solutions for the problem defined in the previous two phases.

- Deliver: Evaluating the concept to choose and delivering the finalized solution.
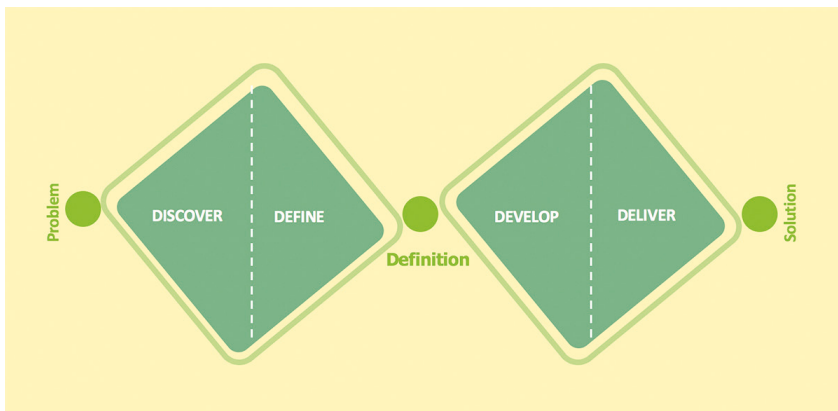
Figure 1. Design process and approach

Each phase is described in this section with brief key findings from the first two phases, which are the basis for self-reflection tool development in the third phase. The research design adopted for each phase is depicted in Table 1 below.

Phase	Source	Method
Discover	• Experts in the fields • Literature • Diabetes educational classes	• Semi-structured interviews • Secondary data collection • Observation and conversation
Define	• Diabetes educational classes • Diabetes Support group • Patients with T2D • Experts in the fields	• Observation and conversation • Observation and conversation • Semi-structured interviews • Semi-structured interviews
Develop	• Diabetes educational class • Diabetes Support group • Patients with T2D • Experts in the fields	• Semi-structured interviews • Critiquing sessions for the developed reflection tools
Deliver	• Patients with T2D • Experts in the fields	• Implementation of the developed refection tools

Table 1. The research design used for each phase

Discover Phase

The inspiration for this study, and a summary of findings from subject matter interviews at the preliminary phase are described in this section. My inquiry began when I went on summer fieldwork with my cohort of four students in May 2018. We were developing a design solution to change behavior for patients with T2D, and semi-structured interviews with patients were conducted as a part of the design process. At that time, I was surprised by the response from one of the interviewees. One of the patient interviewees said that his granddaughter is his motivator for more active engagement in his diabetes self-management, which was contrary to my expectations. I had anticipated a comment about something related to his health concerns such as reducing the chance of diabetes-related complications. His response as inspiration led me to become more interested in humans' intrinsic motivation for health behavior changes and I planned to explore the topic further. I began conducting a literature review into relevant areas and also conducted expert interviews on the emotional and psychological aspects of diabetes self-management in Summer 2018 as a part of the Discover phase of my research.

Relevant literature shows that patients with diabetes are more likely to experience emotional difficulties due to the chronic and serious nature of disease management. For instance, people with diabetes experience depression 2.3 times more than that of the general population (Anderson et al., 2001). Anxiety also commonly occurs in individuals with diabetes and statistics shows that 14 percent of the patients have anxiety and 40 percent experience enhanced levels of sub-syndromal anxiety (Smith et al. 2013). As a design graduate student, I have had opportunities to observe and interview patients and learned that patients in similar situations have differing perspectives of their experience, which are influenced by various factors. For instance, while some patients in the Emergency Department complained about the

long waiting time, others said they were grateful for the chance to be there. My experience of working as a marketing strategist also confirmed this observation. In the context of marketing strategy, a meaning-based approach to advertising is proven to be effective (Mick & Buhl, 1992), and relationship-building between a brand and users is a critical element of developing sustainable competitive advantage within the enterprise (Morgan & Hunt 1996).

Subject matter interviews

Subject matter interviews are valuable sources when researchers need to acquire knowledge in disciplinary fields other than their own (Davies, Duke, & Sure, 2003). For this study, I conducted interviews with a total of 12 experts: 2 in diabetes management, 4 in emotional management of diabetes, 2 in positive design, 4 in gratitude and mindfulness intervention and 1 in diabetes education. The interviews ranged in length from 1 hour to 1 and a half hours documented in handwritten notes. In the interview, my few initial research questions on the emotional aspect of diabetes management were shared, and I asked them to share their experiences and aspects I needed to take into consideration while carrying out my research project. Relevant theories that I needed to explore further were also asked of the participants with a research background (see Appendix I for a list of the expert participants). Key comments from the experts are summarized as follows:

- Reflecting on patients' past diabetes self-management is important.

- Letting patients discover what is good and what is right for themselves is important.

- By asking patients about why they want to be healthy, they can be reminded of the meaning of diabetes management at a personal level.

- Positive psychology intervention such as writing a journal has been proven to be effective and bring a better health outcome, but existing materials are not fun or enjoyable for patients to use.

- Mindfulness techniques have been applied to diet management.

- The importance of integrating physical and emotional well-being should be addressed.

These expert interviews also provided valuable insights into potential challenges in developing design interventions for diabetes self-management. In this regard, Emily Weatherup's, the director of diabetes education at Metabolism, Endocrinology & Diabetes (MEND) of Michigan Medicine, comments are worth mentioning. She referred to her patients as "patients living with diabetes" rather than simply "patients with diabetes," mentioning the continuous nature of diabetes management and daily routines diabetes patients need to take. She also provided me with the opportunity to attend educational classes at MEND as an observer.

Observation of education classes

Attending diabetes educational classes was a valuable opportunity for me to gain a deeper understanding of diabetes self-management. I attended three educational classes. This also offered a chance to talk with the attendees and the educators casually.

Key takeaways from the observations are as follows:

- Each patients' experience is unique. The patients often commented on this: "In my case, it was different."

- The patients commented that they feel confused when they do not find a clue about their high glucose numbers. For instance, even if they eat well and do exercise, they sometimes have to face high glucose levels, and they feel deeply frustrated when this happens.

- The time of their commitment to diabetes education varies. One of the patients indicated in his comment "I was diagnosed with diabetes more than 15 years ago and I need to be motivated again.", but another patient said, "I just got diagnosed yesterday, and I need information."

- The patients often expressed their frustration commenting on this: "I know I have to, but I can't. I have two kids, and I work full time. I just can't make my diabetes management my priority."

Altogether, this Discover phase helped me better formulate my research questions for the next phase of the design process for this project. The design research in the Discover phase and a review of literature generated an initial problem statement as follows:

How might we design self-reflection tools that can support people with Type 2 Diabetes to increase their motivation and engage in diabetes management more actively?

Define Phase

Patient interviews

In my attempt to deepen my understanding of the problem space of diabetes self-management and explore the possibility of implementing the initial idea of self-reflection tools for patients with T2D, I conducted interviews with patients. To recruit patients, I contacted the Office of Patient Experience (OPE) at Michigan Medicine, a department that works with operational units to coordinate and improve the patient experience across Michigan Medicine. With assistance from the OPE, I was able to contact patients who were willing to share their experiences. I then conducted interviews with five patients with T2D. One-on-one interviews were conducted in the Stamps Faculty & Graduate Studios, and the interviews lasted approximately 45 minutes to an hour. All interviews were audio recorded on my smartphone with the participants' verbal consent. The interviews were documented in handwritten notes during the interview. The objectives of the interview are as follows:

1) To investigate motivators and demotivators and related emotions influencing self-management of T2D

2) To identify their unmet needs for better diabetes self-management

3) To identify the opportunity and potential barriers of using self-reflection tools in the diabetes self-management

(see Appendix II for the interview protocol)

Emotion cards, a set of cards with icons showing varying degrees of emotions, were used to facilitate the interviews (see Figure 2 below). This helped explore different emotions that the patient participants had experienced and also helped them remember the emotional experiences they were mentioning. The cards used were downloaded from the Noun project. The Noun Project is a website from which people can search, download and customize millions of symbols (The Noun Project).
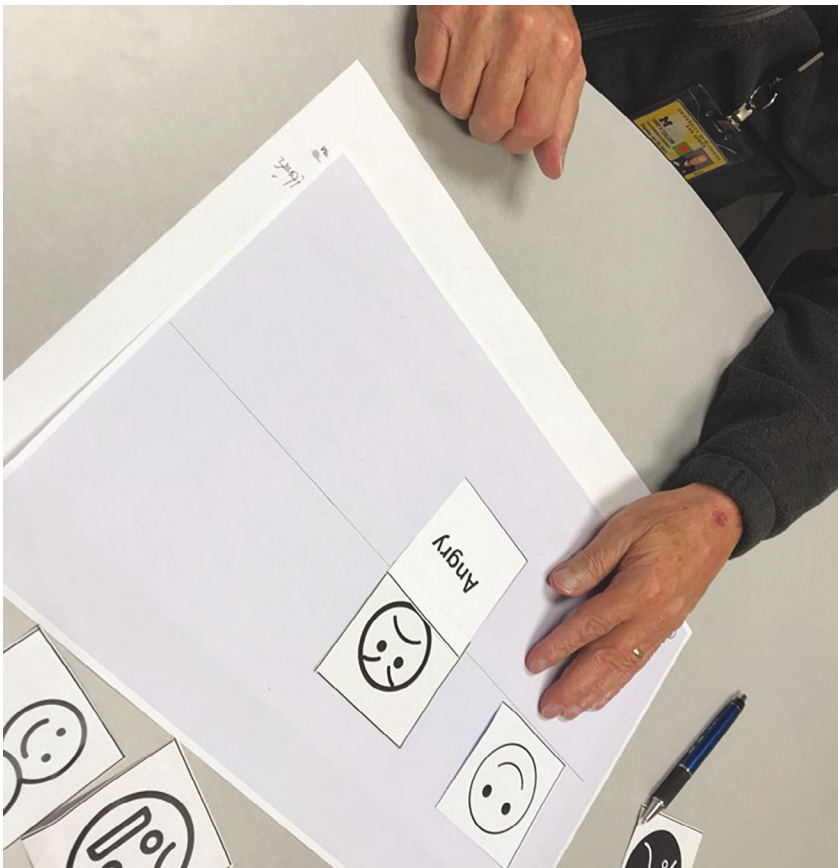
Figure 2. An example of emotion cards

Key takeaways from the patient interviews are summarized below:

- All interview participants pointed out the importance of self-determination. One patient said "We need to become our own best friends," which has also been adopted for my thesis title. Another patient also said "We really need to take diabetes really seriously. "

- There are no absolute motivators or demotivators for patients with 2D. For instance, two patients mentioned their family members as motivators while one patient described his daughter as a demotivator commenting on an anecdote that she bought pasta for cooking for their entire family.

- Patients experience varying degrees of emotional difficulties from frustration, loneliness to depression, which are caused by logistical, physical and social factors.

- Four out of five patients were in favor of the idea of writing a reflection journal idea. One of the five said that she prefers talking to writing.

Interview with health professionals

Semi-structured interviews with diabetes educators were conducted to share the project objectives and discuss any drivers or possible constraints involved in conducting this research project. Three educators participated: two nurse educators and one nutrition educator. The interviews were conducted at MEND and Turner Senior Center and lasted from thirty minutes to 1 hour. The interviews provided useful insight on conducting the project from their hands-on field experiences as well as an opportunity to build a relationship for further contacts.

Key takeaways from health professionals are summarized as follows:

- Reflection is an essential element of diabetes self-management, and design interventions can be a gentle introduction to self-reflection activities.

- The design interventionneed to be enjoyable for patients to use. The intervention designed should not feel like a burden, like homework or an assignment, for the patients.

- There is a waning effect on education; Patients tend to go back to their previous lifestyle after three to six months of education.

- The short-term effect on health behavior change is easy to make but sustaining motivation is hard to achieve.

Insight creation for design interventions

Insights are what designers learn during ethnographic observations and interviews by exploring the context and underlying reasons behind it (Kumar 2012, p. 139). I revisited the notes from my observations and interviews conducted and rewrote findings in short sentences on sticky notes. I then clustered similar issues by theme and placed them under 14 categories as shown in Table 2 below.

Categories	
Logistic difficulties	Possible barrier to intervention
Emotional difficulties	Personal relevance
Positive emotions	Sustainability/Long-term adherence
Negative emotions	Enjoyment
Design principles	Self-reflection/Self-expression
Self-awareness	Self-determination
Positive reinforcement	Motivators

Table 2. Fourteen categories developed from the Define phase of the design process

The patient interviews were coded in pink, expert informant interviews in green, and notes from relevant literature in blue-green (see Figure 3. Affinity map below). After several iterations of this activity, I narrowed down the insights and grouped them into four main topics: 1) self-awareness, 2) positive reinforcement, 3) sustainability and 4) enjoyable and engaging design intervention.
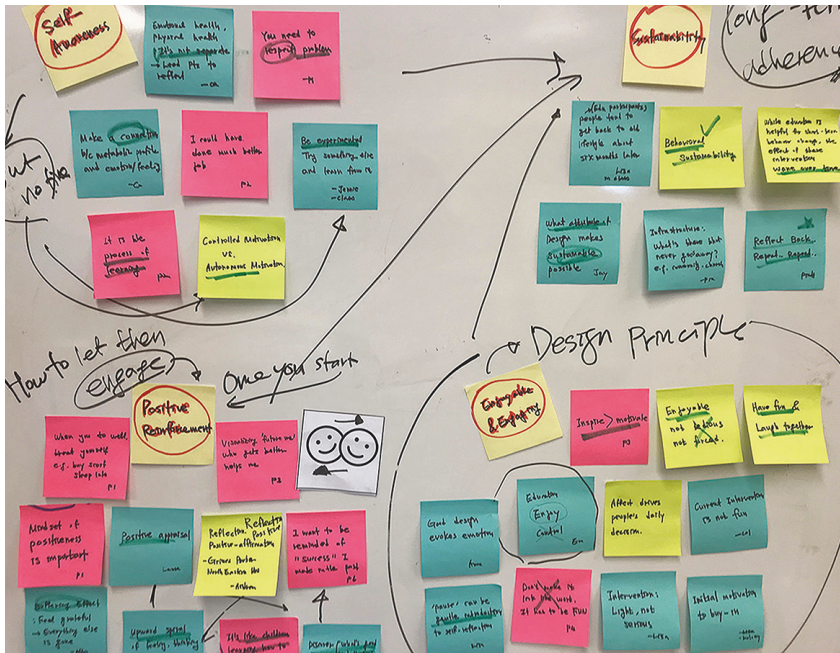
Figure 3. Affinity map

In sum, my experience of observing the diabetes education classes and listening to patients' stories and interviews with experts and patients led me to further develop my understanding around the nature of self-management and the importance of reflection. In Phase 2, another problem statement was added to the initial problem statement:

How might we design self-reflection tools that can support people with Type 2 Diabetes to increase their motivation and engage in diabetes management more actively?

How might we support patients to maintain their interest in a daily practice of self-reflection over time by helping them develop a meaningful association with the practice?

Develop Phase

Based on the patients' needs and possible opportunities for design interventions explored from the ethnographic field observation and interviews in the Discover and Define phase, I designed and iterated a low-fidelity prototype with my thesis partner and stakeholders. The goal of developing the prototype was twofold: 1) to learn about an opportunity and feasibility to implement the planned design intervention and 2) to develop an understanding of challenges to implementation of the designed intervention.

Analysis of existing journals and development of components of the self-reflection tools

The main component of the prototype I created is a self-reflection journal. I first reviewed and analyzed existing journals in the market to find the direction and major sub-components to be included. I generated a list of attributes that could be applied to my project, and the attributes include the structure of journals, specificity of the target users (e.g., widely used or designed for specific population), the ways of expressing users' experience (e.g., writing space or drawing space), the types of journal producers such as therapist or individual artist. Two attributes, the structure of the journal and specificity of target users,

were then selected. These are shown in a two by two table, Table 3 below.

	Specificity of Population	
Structure of Journal	(Type i) For general population without or with less specific guidelines	(Type iii) For specific population with less specific guidelines
	(Type ii) For general population with more specific guidelines	(Type iv) For specific population with more specific guidelines

Table 3. Two attributes of the journal chosen for the project

Type (i): Some topics to think about are given, but without specific guidelines; thus, users have more freedom to write. General topics include "Write five things that you feel grateful for." This type of journal seems to stress that there is no certain way to keep a journal. The majority of journals commercially available at stationery stores or online shopping malls fall into this category.

Type (ii): This type can be used by anyone in general and detailed guidelines on how to use are provided.For instance, a journal created by Therapist Aid leads users to write about specific topics such as what situation the user is in, what they think about most, and how they feel and act at that moment.

Type (iii): Even though this type is designed for specific target users, it does not provide the users with explicit guidelines. For instance, one of the studies (Huffman et al. 2015) conducted on positive psychology intervention for Type 2 Diabetes did not include any specific guidelines or context about how to keep a journal. It only asked the patients to write about events happened and any positive emotions connected to the events.

Type (iv): Detailed guidelines including topics are provided to specified users (e.g., students). For example, students at Northern Illinois University are asked to answer questions to such as "Describe the situation (e.g., the course or the context) you are in" and "What are some good and bad aspects of the situation?" in their reflective journaling task.

Design development: Initial prototype and iteration

I used a piece of paper and sticky notes to create an initial prototype. A paper prototype is a common form of a low-fidelity prototype, which allows designers to test its usability and examine how potential users utilize it and interact with different parts of designed interventions (Kumar 2012). Once the concept of a design intervention is identified, it goes through multiple refinements. I scheduled critiquing sessions with stakeholders including patients, nurse educators, nutrition educators, and physicians. The discussions and interviews centered around what the design interventionbrings about in terms of patients' awareness of and active engagement with their diabetes care and their motivation to manage their diabetes more effectively. The prototype was refined through a series of iterations. This process lasted about three months from January to March of 2019.

After discussion with diabetes educators at Michigan Medicine and my thesis committee members, the initial prototype of the design interventionI created was Type (iii) (See Table 3 above). For instance, Lisa Bosio, one of the nurse educators at the diabetes education class at Michigan Medicine commented that "Make it simple. It shouldn't look like homework or assignment." Simplicity, in fact, was one of the aspects I kept in mind when designing the prototype. For instance, I designed small, simple icons for diabetes management such as food, exercise, and medication and placed them at the bottom of the journal

component so that the participating patients could have more space and freedom to write without being too seriously reminded of their diabetes management (See Figure 4.1). Contrary to my design intention, however, all of the five patients I interviewed at this design phase commented on them saying that they preferred to see these icons more clearly and markedly, so they could be reminded of their diabetes management while reflecting and writing. I then combined some aspects of Type (iv) with Type (iii) (See Table 3). In the final form of the prototype, larger icons were placed at the top left-hand side of the journal (i.e., moved from the bottom) so that patients could see the icons more clearly and write about food, exercise, medication, and blood glucose monitor (See Figure 4.2).

Other main changes applied to the self-reflection journal include the colors, the font of the text, a more spacious writing space for their diabetes management, and an addition of a new section "things I am planning for tomorrow." The color combination of the initial prototype was yellow and red, and Apple Chancery font was used. These changed to yellow and green combination and use of Helvetica font after incorporating the participating patients' feedback, their preference to a larger and easier to read font. A separate writing space was also created to reflect their feedback, in which they can more freely write about their diabetes management. Lastly, the patients commented that planning for the next day is also important as well as reflecting on the day(s) past; therefore, a new section, for "things I am planning for tomorrow" was added to the prototype (See Figure 4.3)
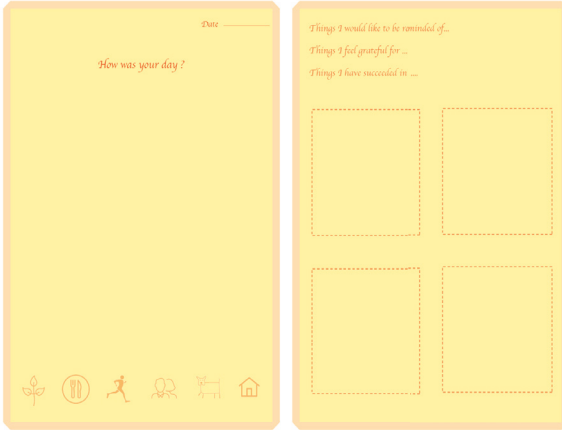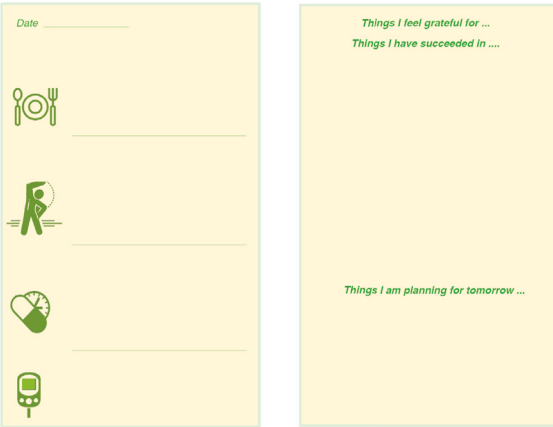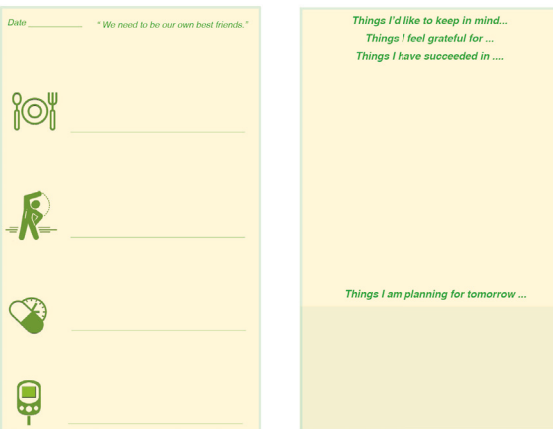
Figure 4.1

Figure 4.2

Figure 4.3

Figure 4. Prototype iteration

The finalized prototype was a rectangle form of a packet, 8.5'' X 5.5" in size with three components: a self-reflection journal, a reminder, and an information card. The main component is the self-reflection journal named "pause." This implies that patients can pause at any time during a busy day and reflect on anything that has happened. For instance, they can reflect on what went right or wrong in terms of their diabetes care on a specific day which can lead to facilitate their self-awareness. The reminder component was composed of different types of materials such as sticky-notes in different colors and paper tags which have encouraging words such as 'cheers' and 'for you.' The sticky notes were intended for patient participants to write something they want to be reminded of (e.g., something they feel grateful for the day or a particular success they achieved in terms of diabetes management). These notes can be attached to the journal next to the diary page or any places at home or in their workplace where they can easily see (e.g., on the fridge or as a wallpaper of their mobile phone). The information card component describes the positive effects of self-reflection on diabetes care and the importance of emotional care. This component was drawn from an idea from the expert, Kelcey Stratton, manager of Resiliency and Well-Being Services Program at the University of Michigan. I conducted an interview with her in the Discover phase, and she suggested this strategy as a way of encouraging and convincing users to participate in reflective activities.

Testing the prototype with potential users

I tested the initial prototype with patients with T2D over three months. First, I tested the prototype with two groups with T2D. One group was diabetes patient participants attending education classes at the Division of Metabolism, Endocrinology & Diabetes (MEND) at Michigan Medicine and another group was a diabetes support group in Ann Arbor. The initial responses from the participants from the two

groups were positive. They said they wanted to try and liked the overall design of the self-reflection tools. However, I soon encountered an obstacle as a student design researcher that it was challenging to have in-depth communication with the participating patients in a group. Thus, after a discussion with my thesis advisors, I changed the plan to have a one-on-one interview with the patients. In doing so a more detailed discussion on usability and feasibility could be possible. Five patients were recruited for a one-on-one interview through the Office of Patient Experience at Michigan Medicine, and they were interviewed three times on a bi-weekly basis. In the first interview, I introduced the self-reflection tools and how to use it, and the patients commented on it by giving their overall impression of the tools. In the second interview, patients were asked to share their experiences of using the tools and gave feedback on it focusing on which aspects they found most useful and what improvements could be made for better diabetes management. Their feedback was then incorporated into making changes to the prototype, and the patients were provided with the revised tools after the second meeting. In the third interview, the patients gave their feedback on the revised prototype (Figure 5).

Figure 5. Interviewing a patient

The goals of this development phase were twofold:

1) Learning about the further opportunity and feasibility of the prototyped intervention including how to implement it.

2) Understanding potential challenges to implement the design intervention.

(See Appendix III for the interview protocols)

After the interviews, I wrote down the patients' responses on sticky notes, clustered them by similar topics, and then grouped them by theme. This process together with the interviews lasted for two and a half months from late January to March (see Affinity map in Figure 6 below).

Affinity map (Interaction Design Foundation 2019), also known as an affinity diagram, is a method used to organize and synthesize data and information that highlight similar issues or opportunities together. It helps designers find new patterns of thinking and emerging theme.

After repeated iterations, implications for feasibility and opportunities below were developed.

- The design interventioncan provide an opportunity for patients to express their thoughts, feelings, and experiences.

- The developed self-reflection tools can help increase problem-solving skills in diabetes management.

- It can facilitate new thoughts about what is important and meaningful in patients' lives.

- It can hold different meanings for different patients.

-

- It can create an opportunity for patients to share their reflection with others.
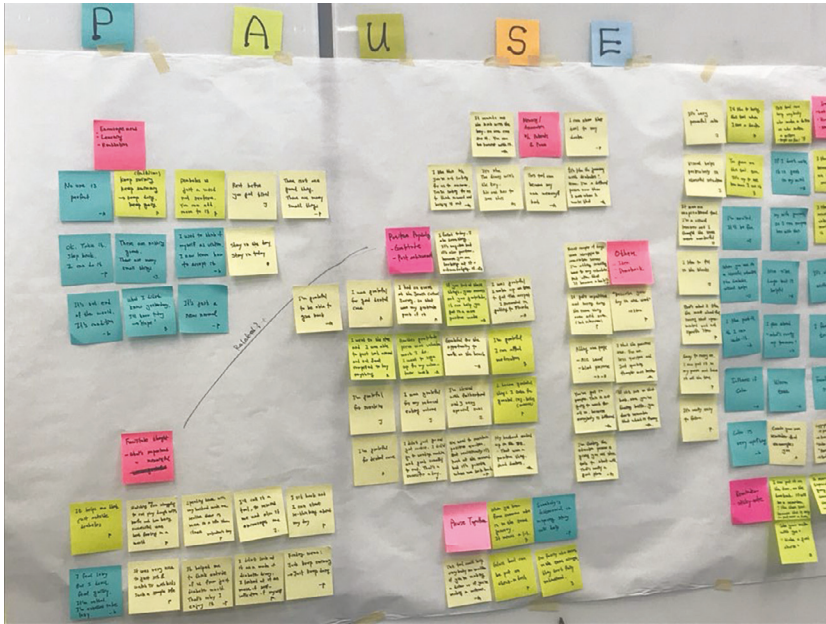
Figure 6. Affinity Map

The last point of implications may need further explication. Some of the stories the patients shared with me at this Develop phase were so inspiring and powerful that it led to a question like "How could patients' reflective stories be shared so patients can learn from each other?" I explored the possibility of utilizing this idea and implemented it in two ways, naming this further exploration 'Pause Together.' First, I re-designed the self-reflection journal component. I inserted some quotes from the previous participating patients at the top, next to the date. Each page has a different quote, and the patients can read them when they reflect. This section was created to provide the patients with feelings of being understood and comfort in the sense that

they are not only those who struggle with Diabetes. I also created a glass bowl filled with encouraging and inspirational messages and stories as a reflection-sharing tool. This glass bowl can be placed somewhere patients can easily see or take with them. For instance, it can be located in a doctor's office so visiting patients can have a read. There can be a few different ways of sharing messages or stories such as a big piece of paper on the wall or a box depending on environmental contexts, so patients can freely share their reflection. Details of findings will be reported in the Results chapter.

Learning from the design process

The design process lent insights into how the designed self-reflection tools can help patients with T2D; however, there were also challenges that arose during the process. First, there were challenges in conducting interviews with patients based on the interview protocol I had prepared. I met with the participating patients for an interview three times during a month, and they were asked to share their stories of family members, struggles and daily lives. As part of the design process, it was important to establish rapport with the patients; therefore, I tried not to interrupt the flow of their talk. However, it was challenging especially when the talk digressed from the main subjects. For instance, one of the patients was struggling with her new medication regimen, and she wanted to talk about how frustrating her life was with diabetes. Within the given short interview time, I then tried to return to the themes of the interview. Their stories of struggles were helpful in the sense that I could better understand their life in general, but it was not fully effective in exploring the questions I had prepared. My effort to be a good listener and researcher who does not view participants as mere data sources, in fact, became a barrier to collecting more relevant and usable sources. A lesson learned from this is that data collection in a design process requires a balance between

efficiently conducting a project as a designer and more humanistically interacting with participants. This can offer some implications: 1) A period of iteration should be carefully considered (e.g., a longer term rather than a short term) and 2) Designers, also as an interviewer, need to acquire and develop interview skills if a project they work on involves interviews especially when building rapport with participants is an important factor as part of a design process.

Second, there were also challenges in understanding and interpreting the participants' views, and opinions in the sense that how they perceive the activities, they are doing do not necessarily reflect how they engage with them. For example, one patient commented in her third interview that she started feeling bored about using the self-reflection tools since it had become repetitive. She had been one of the particularly enthusiastic participants who had used the design interventionalmost every day. She might not have found the tools that useful although she had faithfully used it. From these experiences, I learned that designers should always be aware of the fact that there can have their own bias and assumptions while interacting with participants, which can prevent them from exploring untapped areas of possible issues they are looking into.

Deliver Phase

For implementing the revised and finalized self-reflection tools, I worked with Caroline Richardson, MD, my thesis advisor, and project partner. We discussed potential locations where these developed tools can be implemented, and the Chelsea Health Center at Michigan Medicine was selected for a practical reason.

Twine Project, a research project on T2D patients' motivational and behavioral changes was being conducted under the leadership of Caroline Richardson, so the recruitment of participants was more conveniently carried out through the established pool. The Twine project aims to achieve improved control of blood glucose through continuous glucose monitoring and low carbohydrate diets. Another partner was Grace Ling, a dietitian. She works closely with Caroline Richardson for Twine Project and meets with six to eight diabetes patients every day at Chelsea Health Center. Based on the understanding and implications from the Develop phase and discussion with the two partners, the finalized self-reflection tools (i.e., Pause) and reflection-sharing tool (i.e.,Pause Together) were created and implemented within the Twine Project in late March in 2019. (Figure 7)

Figure 7. Chelsea Health Center, dietitian's office

RESULTS

Self-reflection tools and Reflection-sharing tool

As fully detailed in the Methodology section, the self-reflection tools, Pause (see Figure 7) and Reflection-sharing tool, Pause Together, (see in Figure 8) were developed to support patients with T2D to initiate and maintain their motivation in engaging in diabetes management.

While the self-reflection tools give patients a space to reflect individually, the reflection-sharing tool provides a broader pool of patients with a space for sharing lessons, encouraging messages, and stories that they can learn from each other.

Figure 8. Self-reflection tools, "Pause."

Figure 9. Reflection-sharing tool, "Pause together."

The interview data revealed five main findings. They are outlined and exemplified below.

1. The design of the self-reflection tools evokes positive and engaging feelings to patients.

The general feedback on the design of the self-reflection tool was overall positive. The participants responded favorably to the color combination of yellow and green, the half letter size of the self-reflection journal, simple design, and enough space for their reflection. One patient said, "I like the softness of color." and another said, "it is very uplifting color, and it makes me feel like trying." The size of the journal also gained positive responses from the participants commenting that it can be put into their purse, on their work desk or bed-side table from which they have easy access to it and use. One of the patients shared her experience in keeping a log of blood glucose numbers saying "It was painful to remember and write my numbers. There was no space for feeling. But this one allows much more flexibility. I can write or draw as much as I want." Another patient also commented on the flexibility of the design stating "The visuals help especially when I'm in a stressful condition. I like the freedom to express. It is not rigid."

2. Self-Reflection tools can provide an opportunity to express thoughts, feelings, and experiences.

All five participants commented on the usefulness of the self-reflection tools as it provides an opportunity to express their thoughts, feelings, and experiences. One participant said, "Rather than just go go... and do do..., it was really good to sit and just think about what was good and what wasn't good." Another participant similarly commented on seeing the tools as an opportunity stating, "I don't usually write. Things are

just in my head. Stepping back and thinking about myself was good." It is interesting to note that one of the patients commented on possible broader use of the self-reflection tools saying, "This tool can be used for anybody who makes a dollar or who makes a million. Because thoughts are free!" Another participant commented on her blood glucose numbers stating "You know, I actually can write down my blood glucose numbers in this without feeling judged by others because this journal is private and it's all mine."

All of the comments above demonstrate the value of expressing one's thoughts and feelings regardless of the relevance to diabetes care.

3. The self-reflection tools can help increase problem-solving skills in diabetes management.

Participants found the self-reflection tool, Pause, helpful in increasing their problem-solving skills in their diabetes management. One patient commented on how engaging in reflection helped him in thinking about the problems he had in his diabetes management, promoting an idea, and triggering him to put into action. He stated:

Figure 10. Interviewing a patient

"One day, I realized that I forgot to take meds in the morning. I usually don't forget to take evening meds since I take other medication as well … I thought about why … what about putting the meds on the stove in the kitchen? … so, when I get up in the morning and go into the kitchen, I can instantly see the med on the stove. It was a discovery for me. I haven't forgot to take morning med since then."

<div align="right">*(Patient 2)*</div>

He expressed his joy of solving this long-held problem with his idea, carrying out his idea, and it being successful. Another patient commented on how reflection helped her in being more aware of the importance of doing exercise. She commented:

"One day, I reflected on the day and realized that I didn't take any exercise. So, I just stood up and stepped up and down five times before going to bed."

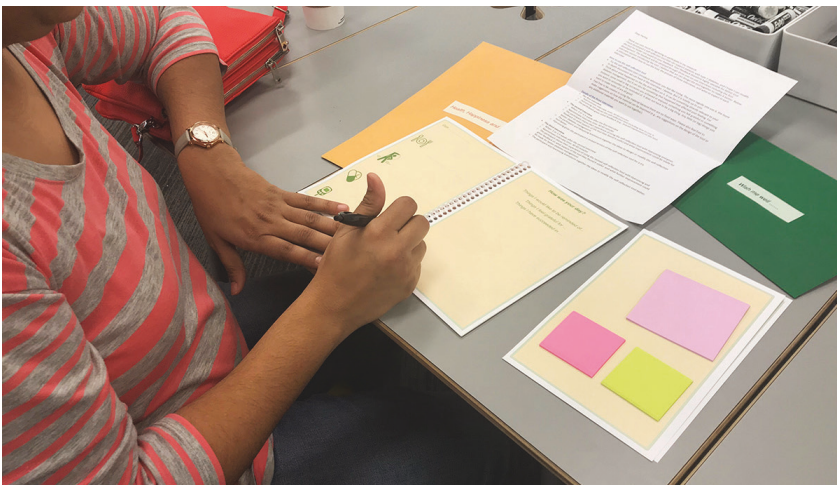<div align="right">*(Patient 3)*</div>

Figure 11. Interviewing a patient

The stories that those two patients shared show that the self-reflection tools can help increase the awareness of the importance of the participants' diabetes management and their commitment to it as the tools provide a chance to engage in reflection.

4. The self-reflection tools can facilitate new thoughts about what important and meaningful things are in patient's lives.

All five participants mentioned that a feeling of gratefulness helped them have a more positive attitude towards their life. In most cases, they associated the feeling of being grateful with their family members, friends, and daily activities rather than with diabetes-related management. For instance, two of the patients said, "I'm grateful for having healthy kids." and "I'm feeling grateful for the friend who spends time with me watching the sunset together." Another patient also said, "I'm grateful to be able to give back at the bowling fundraising event for the youth."

Two of the participants particularly commented on how the self-reflection tools helped them have new views about their life with diabetes and how those changes influenced their daily lives. One patient shared her reflection on one day and mentioned that she needs to change one thing at a time. Another patient shared a discovery she found while watching an animation movie, "Finding Nemo" with her kid. She stated:

"One day, I was just watching the movie, Finding Nemo, with my kids. When Nemo says "keep swimming, keep swimming," it just struck me. I thought, Right … I just need to keep going and keep going with my diabetes. "

(Patient 3)

Both participants were able to acquire a new understanding of and a new perspective on their life and their diabetes management.

5. Self-Reflection tools can hold a different meaning for different patients.

Two of the patients particularly commented on how they associate with the self-reflection tools. One patient commented, "I can look back on not only a certain day but also the past week and past month, and it will become my own memory book." Another patient stated that she wanted to use the self-reflection tools in the way of providing a better understanding for her doctor. She said "I'd like to bring it with me when I see my doctor next time. I can show these tools to my doctor and say...on this day, I had pasta for lunch and I felt something."

CONCLUSION

Discussion

This project aimed to explore how design can initiate self-reflection among patients with T2D and how this reflection might affect their motivation for diabetes self-management. Self-reflection tools were developed to create time and space for patients to pause and think in their busy lives, learn about their health behavior, and find personal meaning in their diabetes management. Such self-awareness and the

meaning-making process would help patients increase and maintain their motivation in engaging in diabetes care activities.

First, the findings of this design research show that self-reflection can have a positive impact on diabetes management. This includes providing free and private space for expressing feelings and experiences of diabetes patients without feeling worried or judged about poor management, increasing problem-solving skills in diabetes care. Most of the participants commented that they appreciated the time to sit and think. Support for this finding is found in the literature on self- expression and therapeutic writing, which emphasize that expressing our thoughts, feelings and experiences can have a positive impact on our health (Furnes and Dysvik 2012).

Second, patients develop new thought about what they are grateful for and what is important in their lives through memories as well as the events that happened to them on a specific day. Caroline Richardson, my adviser, and project partner pointed out that a feeling of gratitude may not directly affect a patient's self-management of diabetes but will indirectly have a good impact on diabetes management by helping them maintain positive emotions and mood.

Lastly, findings also highlight that the design intervention itself can hold meaning for patients. Each patient assigned a different meaning and association with the self-reflection tools, and this can offer valuable insights in terms of building and strengthening emotional ties between users and objects in the field of design and product attachment. This confirms what was reported in the literature on product attachment showing that people use their possessions longer, like products they have, when they can associate them with personal

meanings and memories (Schifferstein and Zwartkruis-Pelgrim 2008).
Since diabetes is a chronic illness, this finding also implies the
effectiveness of self-reflection tools in terms of sustainable use of the
designed intervention.

In this project, as a student designer, I see my role as an initiator who
introduces self-reflection to patients with T2D, engagingly and
enjoyably. In the project advising meetings, it was often commented
that a developed intervention should not be another task or
assignment for participating patients. As one of the patients rightly
pointed out saying "We are all struggling with something. I have lived
with diabetes for thirteen years. But that doesn't mean I am not
struggling." Her comment implies that diabetes management alone
is overwhelming enough and if patients see the design interventionas
another task they need to complete, it is unlikely for them to engage in
it or try to engage in it. Thus, open-mindedness and accommodating to
participants' needs, and continuing discussions with health
professionals such as physicians, nurses and diabetes educators
were critical for this research project as it is emphasized in a study by
Desmet, Overbeeke, and Tax (2001). That is, listening to patients' needs
and accommodate their feedback not only on the function of the
prototype but also on their emotional experiences of using the
prototype were important.

I also learned that stakeholders should become my lens to explore the
context of problem space and I need to constantly expand my
understanding by listening to, interacting with, and learning from those
people from different backgrounds and perspectives. This process
requires humility and sometimes constantly checking my own
unconscious bias. I also realized that in such a process the interests
and passion that I had for certain topics or compassion that I had

toward a certain group of people could prevent me from seeing things from a new or different perspective if I am not cautious about. At the beginning of this project, I was especially interested in the concept of positive psychology intervention; thus, tried to align this idea with diabetes self-management. I, however, soon realized that focusing on evoking positive emotions among diabetes patients might not be realistic when all struggles and difficulties most diabetes patients experience in their everyday lives were carefully considered. I then decided to step back from myself and the ideal of applying positive psychology intervention and see the problem space from the eyes of people living with diabetes. Through the lens of the patients, a concept of "reflection" became the focus of my project, and I then was able to reframe my research questions centering on it.

Limitations

Some limitations in the thesis are worth noting. First, the main part of this study was carried out with a patient advisor with T2D who were recruited through the Office of Patient Experience at Michigan Medicine. They are individuals who agreed to share their experiences to help improve care in the health system of Michigan Medicine. Even though they were patients with T2D, they might not be representative of diabetes patients in general especially in terms of motivational levels such as willingness to try a newly designed intervention.

Second, most participants I interviewed in the Define and Develop phases were patients who were diagnosed with T2D 5 to 15 years ago. They might be relatively more knowledgeable about diabetes management than those who are more recently diagnosed. Their motivation levels might be also different from patients who have lived

with diabetes only for a few years. The designed self-reflection tools were not tested for those patient groups who may find it more helpful or less helpful. Some of the patients commented on this in the interview that these tools might be more useful for patients who are recently diagnosed with T2D since they start forming a new lifestyle. Reflection can then help them learn about their health behaviors and make necessary changes to their eating and exercise habits.

Third, the patients who participated in the Develop phase were interviewed three times on a bi-weekly basis. While this provided the researcher with an opportunity to gather rich data on exploring their experience of using the tools and their feelings, the research context may affect their autonomous motivation in engaging in the designed intervention.

Future work

Although this research has addressed some of the identified gaps in diabetes self-management, motivation and self-reflection, other aspects need further investigation and consolidation.

First, while the key insights on the relationship between users (i.e., patients) and object (i.e., self-reflection tool) were discussed in this study, many other aspects are remaining to be explored. For example, it would be meaningful to examine how association and meaning developed between patients and self-reflection tools has changed over time and how it will affect the patients' motivation in the longer term. Investigating this issue would also provide insights into the sustainability of the designed intervention. Second, this study

explored how self-reflection can affect patients' motivation for diabetes management. However, self-reflection is only a part of diabetes self-management, and other factors such as education and family involvement are also critical. Thus, integrating these key relevant factors with self-reflection may be a promising area for further study. Lastly, a comparison study among patients with diverse ethnic backgrounds is also an area for further research. Studies show that diabetes is more prevalent among certain ethnic groups (e.g., African Americans) (Marshall 2005). In conducting such a study, different concepts and ways of practicing reflection in different cultures need to be carefully considered. This can develop new or different insights on the effect of self-reflection on diabetes management.

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Appendix I

Subject matter interview lists

Diabetes Management

- Caroline Richardson, Family Medicine, Michigan Medicine

- Melissa DeJonckheere, Family Medicine, Michigan Medicine

Emotional aspect of diabetes management

- Gretchen A. Piatt, Dep. of Learning Health Sciences and Health Behavior and Health Education

- Laura Saslow, School of Nursing, Michigan Medicine

- Anna Konigsberg, Social worker, The Division of Metabolism, Endocrinology & Diabetes, Michigan Medicine

- Molly White, Office of patient experience, Michigan Medicine

Positive Design

- Jay Yoon, College of human Ecology, Cornell University

- Colleen Seifert, Dep. of Psychology, University of Michigan

Gratitude and mindfulness

- Nansook Park, Dep. of Psychology, University of Michigan

- Afton Hassett, Anesthesiology Clinical Psychologist, Michigan

Medicine

- Kelcey J. Stratton, Office of Counseling and Workplace Resilience, University of Michigan

Education

- Emily Weatherup, Director, Diabetes Education, The Division of Metabolism, Endocrinology & Diabetes, Michigan Medicine

Appendix II

Patient Interview Protocol

(Discover phase)

The objectives of interviews
To investigate motivators and demotivators influencing Type 2 diabetic patients in terms of managing diabetes-related stress and distress and identify their unmet needs for better health management

Interview questions

- How long ago were you diagnosed with Type 2 diabetes?

- How old are you?

- How did a week go?
  How do you manage your diabetes? Do you live on your own, or with others?

Demotivators

- Have you encountered any difficulties?

- How did you feel?

- Is there anything, you feel, that could have made it easier for you to deal with it (such as people in your family or people in healthcare, or things in that situation)?

- What strategies do you use when you feel something negative? Or are there any strategies you heard from other diabetic patients and would like to try?

Motivators

- In dealing with your health in general, when do you feel good, optimistic or hopeful?
  (e.g., after doing exercise or when your glucose level is good)

- What makes you, or motivates you to, keep maintaining a healthier lifestyle such as a healthier diet and regular exercise? (There might be some challenging elements such as people, your living environment, or your habits or preferences, but despite those), is there anything that helps you better manage your health?

- Can you describe the feeling you had at that time? How did you feel about that?

Connection, Support

- In your experience of managing with your diabetes, do you think there is a connection among eating, doing exercise and your feeling?

- Do you use anything that helps you manage your diabetes such as a mobile app, a diet diary, or keeping a journal?

- Have you attended any education classes or therapy sessions to get help or learn how to better deal with your diabetes? How did you find it? And what aspects of the class or session did you like most?

- Would you be interested in trying a designed tool such as taking notes which would help you reflect on your day and feelings?

- What could you support you?

Appendix III

Patient Interview Protocol

(Develop Phase)

Research questions

- How might we design self-reflection tools that can support people with Type 2 Diabetes to increase their motivation and engage in diabetes management more actively?

- How might we support patients to maintain their interest in engaging in self-reflection over time by helping patients develop personal/meaningful relationship/attachment with these tools?

1st Interview questions

- Before you tried this self-reflection, had you ever kept a journal? If you had, how did you find the self-reflection in the PAUSE compared with the one you used to keep before?

- Can you tell me your overall impression on these self-reflection tools?

- What sustain/motivates you to keep engaging in diabetes management?

- If you meet someone who has just been diagnosed with diabetes, is there anything you would like to say to them or any stories you would like to share with them?

- This is yours. It's up to you if you bring it or not to the next interview.

2ndInterview questions (usage pattern, open-ended question on reflective activity)

- Before you tried this self-reflection, had you ever kept a journal? If you had, how did you find the self-reflection in the PAUSE compared with the one you used to keep before?

- How did it go? Can you share your overall experience of using the self-reflection, "PAUSE"?

- Where did you keep the PAUSE? Did you bring it with you to work or did you use it at home?

- How often did you use it? What times of the day did you use it and why? How long did you spend time using it each time?

- Was the self-reflection helpful? If so, in what aspects and how? If not, what could be reasons for it to be unhelpful?

- Did you find anything new, interesting, or surprising?

- Did you notice any changes in your emotions, feelings, or thoughts while engaging in the reflective activities in the PAUSE? (Did anything interesting come up to you?)

3rd Interview questions (more specific on reflection experience)

- How did it go? Can you share your overall experience of using the self-reflection, "PAUSE"?

- What parts of the PAUSE did you find most useful so far?

- Do you have any suggestions for making it better? For example, do you have any ideas for the icon, color, language or materials like sticky notes?

- Did you experience any difficulties or challenges in your

engagement with the PAUSE? If so, what were they? And why do you think you found them difficult or challenging?

- Do you have any suggestions for resolving the difficulties or challenges? Or any helpful ways to deal with those difficulties/ challenges better?

- How about the part of recalling something you feel grateful or some success you achieved?

- How did it go? Was it helpful? If so, could you tell me in what ways it was helpful? If not, why do you think it was not helpful?

- Did you use sticky notes? If so, how did you use them? Did you find them easy to use? If not, can you suggest any other forms, instead of sticky notes, that can be more easily used?

- If you meet someone who has just been diagnosed with diabetes, is there anything you would like to say to them or any stories you would like to share with them?