EXPERIENCE OF TELEPHONE-BASED DIABETES HEALTH COACHING

AN INTERPRETIVE DESCRIPTION OF THE EXPERIENCE OF RECEIVING TELEPHONE-BASED DIABETES HEALTH COACHING AMONG COMMUNITY-BASED ADULTS WITH TYPE 2 DIABETES MELLITUS

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Declaration of Academic Achievement

I, Tharshika Sugumaran, declare this thesis to be my work. This thesis is an original synthesis of the research presented. No part of this work has been published or submitted for publication or for a higher degree at another institution.

My supervisor, Dr. Diana Sherifali, and the members of my supervisory committee, Dr. Jeanette LeGris and Dr. Patricia Strachan, have provided guidance and support at all stages of this project.

Abstract

Background: Over the last decade, diabetes health coaching, also referred to as diabetes coaching, has emerged as a patient-centered intervention to assist individuals with type 2 diabetes mellitus (T2DM) in acquiring independence with self-management. The structure and delivery of such interventions have varied greatly while showing improvements in glycemic control. However, literature continues to show a gap around the patient experience of receiving diabetes coaching support.

Objective: To explore the perceived experience of receiving telephone-based diabetes health coaching among community-based adults with T2DM within the Canadian context.

Methods: A qualitative exploration with an interpretive descriptive design was carried out. Participants from the intervention group of a larger randomized controlled trial who had received a telephone-based diabetes coaching intervention over one year were invited to participate in a telephone interview with open-ended questioning.

Findings: A total of 12 participants were interviewed and four major themes were identified. (1) *Adapting to life with T2DM* reflects how coaching helped individuals to integrate diabetes into their lives by addressing misconceptions, providing knowledge, encouraging awareness, and easing transition onto insulin. (2) *Heightened mindfulness of diabetes-related wellness* captured the greater attention participants' gave to their overall well-being and self-management behaviours. (3) *Behaviour change guided by the participant* highlights the differences in participants' motivation, readiness to make changes, external factors that influenced their ability to make self-management behaviour

changes. (4) Lastly, *valuing a supportive relationship* illustrates that participants felt the unique coach-client relationship was reliable, holistic, non-judgmental, and encouraging. **Conclusion:** Overall, participants found diabetes coaching to be positive and highlighted the various ways it was able to support their ability to more effectively self-manage their diabetes.

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List of Abbreviations

CCM	Chronic Care Model
CHC	Community Health Centre
HbA1C	Hemoglobin A1C; glycated hemoglobin
HCP	Healthcare Professional
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines
RCT	Randomized Controlled Trials
SDT	Self- Determination Theory
SME	Self-management Education
SMS	Self-management Support
T2DM	Type 2 Diabetes Mellitus
TPB	Theory of Planned Behaviour
QoL	Quality of Life

Chapter One

Introduction

In 2014, the World Health Organization (WHO) estimated that the global burden of diabetes was 8.5% for all adults over the age of eighteen (WHO, 2018). More alarmingly, the WHO estimated that in 2016, 1.6 million deaths were attributed to diabetes, making it the seventh leading cause of death with type 2 diabetes mellitus (T2DM) accounting for a majority of these cases (WHO, 2018).

Diabetes Canada (2019) identifies that eleven million Canadians are either living with or at risk for developing diabetes (Canadian Diabetes Association (CDA), 2019) Amongst all Canadian provinces, Ontario has the highest prevalence of diabetes (CDA, 2019). The cost of treating diabetes nationwide has risen to just under 30 billion this year from 14 billion in 2008. The largest fraction of health care system spending related to diabetes is spent on acute hospitalizations (Bilandzic & Rosella, 2017). Inadequate self-management practices due to increasing costs of medications and equipment, and lack of support have led to an increasing amount of diabetes-related complications and subsequently, absenteeism amongst Canadians with diabetes and their caregivers (CDA, 2019).

T2DM is understood to be the result of both genetic and environmental factors (Brashers, Jones, & Huether, 2019, p.688). The most common risk factors include age, obesity, hypertension, poor diet, physical inactivity, and previous family history. Thus, it is not surprising that the prevalence of T2DM continues to increase due to our demographic rise in obesity and sedentary lifestyles (WHO, 2018). Over 65 genes

involved in pancreatic beta-cell mass and function, insulin molecular structures, insulin receptors, hepatic gluconeogenesis, and cellular responsiveness to insulin are all found to be associated with T2DM. As a result, the etiology involves multi-organ causes of insulin resistance and compromised insulin production leading to varying degrees of hyperglycemia (Brashers et al., 2019, p.688-689). Over time, chronic hyperglycemia damages insulin-producing pancreatic beta-cells and causes dysfunction of pancreatic alpha-cells responsible for gluconeogenesis. This results in a cycle of elevated glucose levels and insulin inactivity. This insulin resistance in turn is found to be associated with various other prevalent metabolic conditions such as hyperlipidemia, hypertension, and atherosclerosis, thereby increasing the risk for cardiovascular disease (Brashers et al., 2019, p.698). Despite these monumental changes on a biological level, individuals with T2DM may go several years without seeing any clinical signs or symptoms of the illness due to compensatory hyperinsulinemia secondary to insulin resistance (Brashers et al., 2019, p.688).

Since symptoms of T2DM can often go undetected for several years, diagnosis and treatment may be delayed, thereby increasing the risk for complications (WHO, 2018). Acute complications may include non-ketotic hyperosmolar coma, a life-threatening condition that occurs when glucose levels are too high (WHO, 2019). Both untreated and poorly managed diabetes can lead to premature death and result in severe vascular complications that impede quality of life. Prolonged elevation of blood glucose levels can lead to the damage of small blood vessels of the eyes, kidneys, and nerves resulting in blindness, renal failure, impotence, and diabetic foot disorders, respectively.

Macrovascular complications may include cardiovascular diseases such as myocardial infarctions, strokes, and reduced blood flow to peripheral limbs (WHO, 2019). Common comorbidities associated with T2DM are similar to those of many other common chronic illnesses such as hypertension, heart disease, arthritis, and chronic obstructive pulmonary disease (Public Health Agency of Canada (PHAC), 2011). As a result, approximately a third of Canadians living with T2DM are also managing two or more other comorbidities (PHAC, 2011).

Optimal diabetes management is comprised of adopting healthy lifestyle behaviours (physical activity, health eating), glycemic management with pharmacotherapies and glucose monitoring, and cardiovascular disease prevention and management (i.e. blood pressure and cholesterol management) (Houlden, 2018). Furthermore, individuals should be provided with the necessary tools and strategies to develop these management skills including medications, devices, target guidelines, and patient education (Houlden, 2018).

Diabetes Canada recommends that an expanded chronic care model (CCM) of management be employed for those diagnosed with T2DM (Clement et al., 2018). One of the six domains of the CCM is self-management support (SMS), which includes: education, behaviour change, and psychosocial aid, follow-up, and monitoring through clinical and community support networks. In recent years, evidence suggests that SMS should complement self-management education (SME) to provide engaged ongoing case management and support to foster independence amongst individuals with T2DM (Clement et al., 2018). To achieve this, it is recommended that SMS incorporate skills in

problem-solving, ongoing surveillance of ones' health, and goal setting (Sherifali, Berard, Gucciardi, MacDonald, & MacNeill, 2018). Diabetes Canada further recommends that SME should be tailored to individual needs with consideration for a client's abilities, challenges, cultural needs, literacy level, access to resources and supports, and includes an incentive for learning and management (Sherifali et al., 2018). Ideally, both SME and SMS efforts should strive to be holistic. They should address both medical and psychosocial aspects of care to aid individuals to acquire informed decision-making skills and to help them develop and attain health-specific goals.

The literature suggests that a wide range of professional and lay individuals provide SMS, often with varying training, education, and experience. Such individuals can include but are not limited to certified diabetes educators, diabetes coaches, healthcare providers, and peer group support. Furthermore, the delivery of SMS has grown to include various technological platforms including telephone, web-based, and text-messaging communication (Sherifali et al., 2018). The rising prevalence of T2DM, associated complications of the disease that impact patients' lives and need for care, and the economic burden to our healthcare system support further research into potential strategies for diabetes SMS.

Health coaching has emerged as a newer approach to SMS for individuals diagnosed with chronic illness (Olsen & Nesbit, 2010). Health coaching is a client-centered intervention often incorporating some form of goal-setting, motivational interviewing, and collaborative work techniques. Moreover, evidence suggests that it improves various aspects of healthy behaviours including dietary habits, physical activity,

better weight management, and adherence to medications (Olsen & Nesbit, 2010). Deriving from this, diabetes health coaching, also referred to as diabetes coaching has emerged, as a new SMS strategy to provide individuals living with T2DM with customized support to meet a client's unique self-management needs by fostering the acquisition of self-care skills, behaviour modification, and ongoing routine follow-ups (Sherifali, Viscardi, Bai, & Ali, 2016). More recently, the use of health coaching for T2DM has been shown to significantly improve glycemic control (Pirbaglou et al., 2018).

Over the last decade, an understanding of what constitutes health coaching for diabetes has emerged. Sherifali (2017) conceptualizes diabetes coaching as the practice of providing education and health promotion through coaching to facilitate the attainment of individual-driven goals geared at improving the management of diabetes. Sherifali (2017) proposes a model for diabetes coaching comprised of four core domains that a diabetes coach utilizes. The components include: 1) case management and monitoring; which emphasizes healthcare system navigation and non-judgmental monitoring; 2) self-management education and support, which refers to providing knowledge and skills to manage one's diabetes; 3) behaviour modification, which highlights the need to work with individuals to establish realistic goals, recognize barriers and facilitators and use strategies of motivational interviewing; and 4) provide psychosocial support; which requires active listening, attention, empathy and ongoing support (Sherifali, 2017). Figure 1 below shows a visual representation of the diabetes-coaching model as proposed by Sherifali (2017).

Figure 1

Diabetes Coaching Model (Sherifali, 2017).

While all domains are essential for optimal diabetes management, each component may vary in the time and attention required given the situation and needs of the individual. Sherifali (2017) further emphasizes that coaching should be delivered by a regulated healthcare professional trained in the model. Preferably, the healthcare provider should be certified in diabetes education with experience in both motivational interviewing and behaviour modification. The diabetes coaching model proposed by Sherifali (2017) aligns with the health and wellness coaching recommendations outlined by Wolever et al. (2013) but within a diabetes context. Moreover, Sherifali (2017) provides possible outcomes that may be measured to evaluate the effectiveness of each component of the proposed model; completion of routine clinical assessments for

personal case management and monitoring; self-care or knowledge scales for self-management education and support; monitoring dietary habits and physical activity levels for behaviour modification; and treatment satisfaction or quality of life scales for psychosocial support. Overall, diabetes coaching remains a client-centered intervention whereby, coaches focus on goals developed by individuals and provide the necessary support, guidance, knowledge, and motivation to facilitate their success in meeting them (Sherifali, 2017).

Nevertheless, the structure and delivery of diabetes health coaching, specifically for those with T2DM, remains largely inconsistent. To date, diabetes health coaching interventions have been conducted by professionals of varied training, backgrounds and expertise, and delivered across diverse technological platforms. As a result, it remains unclear what specific training diabetes health coaches should have and how the coaching intervention should optimally be delivered. Furthermore, much of the research to date has focused on clinical outcomes, such as glycemic control alone. The primary aim of the following research was to explore the perceived experience of receiving diabetes health coaching. More specifically, this research focused on the experience of community-based adults with T2DM in the Canadian context. Greater insight into the human experience of receiving diabetes health coaching will help future health care providers determine how best to utilize coaching as a SMS strategy for individuals living with T2DM.

Reflective Summary

As a Registered Nurse (RN), who has worked with both adults and children with diabetes, I have been influenced by the stories and experiences of both my clients and their families in clinical practice. During my experience as a nursing student, I worked with numerous adults living with T2DM within both an inpatient and emergency room setting. During this time, I frequently worked with clients who were struggling to manage their diabetes due to various life stressors. In particular, I often came across clients who had difficulty managing their T2DM when faced with multiple coinciding chronic conditions. These conditions ranged across systems and were not limited to but included those of the cardiovascular, renal, and neurological systems. As such, clients often found themselves in a cycle where their T2DM was not only impacting other conditions but was also affected by them. It was easy to see that having to not only manage T2DM but other chronic conditions, often became a balancing act for many of these adults. The ability to self-manage well was also heavily influenced by the amount of support that clients received outside of their medical teams. Clients would frequently remark on how they felt more secure at home with greater spousal or other familial support in the event of an emergency as well as, to provide reminders with medications and appointments and assist with transportation. The importance of this support was heavily essential for senior adults who were further impacted by cognitive impairments and limited mobility, making it harder to self-manage well on their own.

More recently, I had the opportunity to complete a placement with a diabetes Clinical Nurse Specialist (CNS) at the Hamilton General Hospital. During this time, I was

able to follow numerous adults with T2DM within various inpatient units from the point of admission to discharge from the hospital. I quickly learned how challenging T2DM management is for adults who are facing multiple chronic conditions. I was able to observe some of the challenges that the CNS experienced when providing discharge planning and education within a short period of fifteen to twenty minutes. Seldom was this enough time for clients to ask all the questions they wanted or to practice running through scenarios they may face at home. Clients often voiced their financial concerns in regards to accessing the necessary supplies (insulin needles and test strips) to adequately manage at home. While efforts were made by the CNS to provide additional resources, it was easy to see that many clients left the hospital feeling stressed about how they would afford their supplies. Furthermore, clients often reported that they were worried about being able to make it to follow-up appointments in the community due to a lack of support and access to transportation. During my placement at Hamilton General Hospital, I had the opportunity to work on a discharge education bundle for clients and their families. While it felt comforting to send clients home with information and contacts, it was also apparent that not all clients were able to understand, manage, or felt supported. My experience throughout this placement allowed me to understand the challenges that our adult clients with T2DM face within the constraints of our healthcare system leaving them vulnerable to becoming lost within it. Overall, my clinical experiences have shaped my interest in exploring different strategies for supporting community-based adults with T2DM, to optimize their diabetes self-management and avoid unnecessary hospital admissions.

Overview of Thesis

The purpose of this study is to explore the experiences of community-based adults living with T2DM, who have received telephone-based diabetes health coaching. It is anticipated that the findings of the following study will provide a greater understanding of how this intervention influenced adults living with T2DM, specifically related to their self-management. This first chapter provides an overview of what comprises diabetes self-management and the challenges that community-based adults with T2DM may face. Chapter Two will provide an overview of the literature related to the use of health coaching in chronic conditions, including T2DM. Within this overview and critical analysis, gaps in the current literature will be identified. Chapter Three will describe the methodology that was used to conduct this study, including details of setting, recruitment, data collection, and analysis. Chapter Four will review the findings, including the demographics of participants and the main overarching themes that were identified. Lastly, Chapter Five will conclude with a discussion of the implications of the findings in regards to nursing practice, education, policy, and future research. Chapter Five will further highlight both the strengths and limitations of the study.

Chapter Two

Literature Review

The purpose of this literature review is to provide an overview of the emerging concept of health coaching and more specifically, health coaching for T2DM. An initial search of the literature was conducted to identify studies examining the utilization of health coaching in the management of chronic illnesses. This was followed by an exploration of health coaching as an intervention to support self-management amongst individuals with T2DM.

Adapting and maintaining health behaviours such as a healthy diet, adequate physical activity, and medication adherence is essential for effectively managing chronic conditions including T2DM. Recently, health coaching has emerged in the literature as a potentially effective intervention to assist individuals with behaviour modification, self-management, support, and goal attainment (Palmer, Tubbs, & Whybrow, 2003). As an alternative intervention to provide both patient education and support, health coaching may be valuable in aiding with self-management among those with chronic conditions.

A search of the databases CINAHL, PubMed, OVID Medline, PsychINFO, and Google Scholar was undertaken for this review. The following key terms were used in various combinations in the search strategy: type 2 diabetes*, non-insulin dependent diabetes, health coach*, diabetes coach*, coach*, nurse-led*, and community-based. The term qualitative was also combined (Appendix A). Given the rise in health coaching literature in more recent years, the literature search was restricted to publications in English from 2010 to the present date to capture the most relevant publications. Studies

that reported findings of type 1 diabetes mellitus, participants under the age of 18, insulin-dependent diabetes, gestational diabetes, or women who were pregnant were excluded from this literature review. Where available, the age filter was used in place of the search term adult*. A total of 12 publications were selected for this review; see Appendix A Table 1b for details. Further, the critical appraisal of all selected literature is provided Appendix A Table 2.

Conceptualizing Health Coaching

Health coaching remains an evolving construct. Palmer et al. (2003) provided one of the earlier descriptions of health coaching as providing support and instruction to facilitate the acquisition of skills to enhance the performance and wellbeing of another. The term health coaching originated from the work of motivational interviewing which had been developed to address alcoholism: both constructs have been used interchangeably within the literature (Huffman, 2010). Unlike traditional patient education methodologies, health coaching goes beyond the objectives of the provider. Health coaching aims to assess the readiness of clients for change including their motivations and barriers to provide tailored health teaching and support (Huffman, 2010). Huffman (2010) argues that effective health coaching requires a focus on the patient's agenda, active listening, engaging in discussions regarding change and developing goals, and establishing a relationship of accountability. Palmer et al. (2003) defined health coaching as, "the practice of health education and health promotion within a coaching context, to enhance the wellbeing of individuals and to facilitate the achievement of their health-related goals (p.92)." Presently, there remain varying definitions and applications

of health coaching as an intervention thereby, making it challenging to determine which approach is most effective.

Olsen and Nesbitt (2010) conducted an integrative review of fifteen studies between 1999 and 2008 to investigate the effectiveness of health coaching interventions in improving healthy lifestyle behaviours. They evaluated measures related to various lifestyle behaviours including diet, physical activity, weight management, medication adherence, smoking, alcohol consumption, and additional preventive healthcare practices (Olsen & Nesbit, 2010). The review included articles that specifically referred to the intervention as coaching and comprised both quantitative and qualitative studies.

Results suggested that health coaching interventions may be an effective approach for cultivating healthier lifestyle behaviours. Significant improvements were noted in the areas of improved nutrition, weight management, medication adherence, and increased physical activity (Olsen & Nesbit, 2010). However, health-coaching programs varied greatly in the duration and frequency of delivery, professional background, and training of coaches, and conceptual design. The review identified that key components of effective health coaching programs included goal setting, elements of motivational interviewing, and collaboration with primary health care providers. Olsen and Nesbit (2010)'s integrative review also identified nursing as the health discipline most actively engaged in administering health-coaching programs.

The effectiveness of health coaching interventions remained inconclusive however, as a result of numerous limitations among the reviewed studies (Olsen & Nesbit, 2010). Seven of the fifteen included studies were randomized controlled trials

limiting the ability of the review to assess effectiveness. The findings supported the need for future research to more clearly conceptualize and define health coaching, and describe the skills and training required to implement this intervention, so that it may be distinguished from similar counselling approaches. Furthermore, rigorous studies utilizing random sampling and designs evaluating fewer intervention variables are needed to adequately assess effective health coaching programs (Olsen & Nesbit, 2010). Overall, they found that health coaching is a potentially beneficial intervention for healthcare providers maintaining long-term relationships with patients living with a chronic condition (Olsen & Nesbit, 2010)

Wolever et al. (2013) conducted a systematic review to better define health and wellness coaching. Again, findings revealed major inconsistencies in both the definition and operationalization of health and wellness coaching in reviewed studies. The search was limited to only PubMed and examined citations outside of empirical studies to better understand the emerging conceptualization of health and wellness coaching. Across available studies, the coaching intervention varied in the techniques applied, theoretical underpinnings, frequency and length of delivery, methods of contact with providers, professional background of providers, and the amount and type of educational content provided (Wolever et al., 2013).

Despite these variations, key universal health coaching components identified in the findings include a patient-centered approach incorporating self-discovery processes, patient-determined goals, content information, and measures of accountability within the realm of an ongoing supportive relationship (Wolever et al., 2013). Only half of the

articles included in the review provided any description of the training that coaches had received. Of those that did specify, training included instruction in behaviour change skills, health information content, and job training (Wolever et al., 2013).

Similar to the findings of Olsen and Nesbit (2010), many had utilized skills in motivational interviewing which involves the use of open-ended questions, reflections, affirmations, a discussion of situations of ambivalence, and reinforcement of the individuals own intentions for change (Hall et al., 2012; Wolever et al., 2013). Based on their emerging definition, Wolever et al. (2013) recommended that health professionals delivering health coaching interventions should be trained specifically in coaching processes. They emphasize that health and wellness coaching is an intervention where healthcare providers do not merely provide patient education but collaborate with and empower clients to achieve their personal health-related goals (Wolever et al., 2013).

It remains unclear whether educational content should be delivered by other providers than the coach themselves, whether health coaching should be a standardized process or individually tailored, and if technology in communicating with clients would be effective in building strong rapport and enhancing accountability (Wolever et al., 2013). Wolever et al. (2013) found that approximately a third of the articles reviewed did not provide details regarding the coaching methods used thereby, making it difficult to evaluate the effectiveness or to allow their replication. Wolever et al. (2013) concluded that future studies examining the impact of health coaching should provide detailed descriptions of the intervention techniques as well as, the professional background and training for coaches to allow for more rigorous comparisons and meta-analyses.

Kivela, Elo, Kyngas, and Kaariainen (2014), also conducted a systematic review of 13 studies from 2009 to 2013 to examine the types of effects that health coaching had on adults living with chronic diseases. Eleven studies were randomized controlled trials of which three included only those with T2DM. The health coaching interventions varied in delivery, duration, frequency, type of health care provider, and point of follow-up across studies. Again, a meta-analysis and evaluation of overall effectiveness were not possible due to the variation in the methodology and outcomes measures as well as, application of health coaching. Similar to Olsen and Nesbit (2010), it was found that in studies in which significant behaviour changes occurred, the coaching intervention was delivered for a minimum of six months (Kivela et al., 2014). Although telephone coaching was most common, other methods of delivery included the Internet, email, and face-to-face interactions.

Their findings revealed that clients found health coaching to be physically, psychologically, behaviorally, and socially beneficial (Kivela et al., 2014). The outcomes assessed varied according to the chronic conditions; behavioural outcomes included physical activity, willingness to change, lifestyle choices, and medication adherence. Psychological outcomes examined the quality of life, knowledge of illnesses, mental health, and stress (Kivela et al., 2014). Social outcomes included the ability of clients to communicate with healthcare providers, social supports, and the availability of social resources. Results showed significantly better weight management, improved physical and mental well-being, and an increase in both social support and self-efficacy. Specifically, two studies found marked improvements in glycated hemoglobin (HbA1C)

for those living with T2DM at follow-up at both three and six months respectively. Studies that showed significantly better outcomes were found to utilize psychologists, educated coaches or experienced health lifestyle coaches.

Through their review, Kivela et al. (2014) found that health coaching could be used not only to support self-management practices but also, motivate individuals to adopt healthier lifestyles when combined with a readiness for change. However, two of eleven studies had measured effects within two months, which may be problematic given that some barriers or challenges cannot be overcome in such a short period, and the long-term sustainability of changes is unknown (Kivela et al., 2014). They were unable to conduct a meta-analysis due to the variability in methods and outcomes measured. The authors further acknowledge that the term 'health coaching' remains relatively new in the literature and other relevant interventions geared at this same objective may have been excluded in this review. Health coaching was found to have the most positive effect on clients with a chronic disease such as diabetes (Kivela et al., 2014).

Studies conducted on health coaching show great variation in both theoretical underpinnings and implementation of the intervention in practice. This is further complicated by its use in the self-management of various chronic conditions and administration by a range of professionals with different training, skills, and knowledge. Nonetheless, there appears to be some consensus that health coaching is a patient-centered intervention with a focus on clients developing their personal health goals and actively partaking in the process of attaining them (Wolever et al., 2013). There has been a rise in the number of peer-reviewed publications on the topic of health and wellness

coaching since 2010 (Wolever et al., 2013). For this research study, a more focused literature search was conducted to explore the use of health coaching for T2DM.

Diabetes Health Coaching

Sherifali et al. (2016) conducted the first systematic review to specifically evaluate the impact of health coaching amongst adults with T2DM. The meta-analysis included eight randomized controlled trials that evaluated the effect of diabetes health coaching on glycemic control against usual diabetes education and care. Diabetes health coaching interventions across all studies involved some form of goal-setting, attaining new knowledge, personalized care, and regular follow-up support (Sherifali et al., 2016). However, the coaching interventions varied in delivery ranging from telephone-only, in-person, or a combination of both. Also, a few incorporated the use of the Internet and web-based applications allowing participants to track their health parameters and provide further decision-making support. Sherifali et al. (2016) found that individual coaching sessions lasted anywhere from as short as 15 minutes to over an hour in length. Furthermore, the sessions were provided either on a consistent weekly basis, monthly basis, or as negotiated between the client and coach. Across studies, clients received diabetes health coaching interventions anywhere from a period of three months to ten months with follow-ups taking place anywhere from six to twelve months later (Sherifali et al., 2016).

Results of the meta-analysis showed improvements in glycemic control among diabetes health coaching intervention groups indicated by statistically significant reductions in glycated hemoglobin levels (A1C) at six months by 0.32% (95%CI, -0.50 to

-0.15) and 0.57% (95%CI, -0.76 to -0.38) for longer interventions. These improvements were greater in those who had more than six months of coaching (Sherifali et al., 2016). Self-care management and quality of life outcomes were not included in the meta-analysis due to the limited number of studies that reported these outcomes. The review concluded that supplementing standard diabetes education and care with health coaching might be an effective approach for improving overall glycemic control (A1C) (Sherifali et al., 2016).

Strengths of the review include being the first to examine the effect of health coaching on diabetes alone (Sherifali et al., 2016). Furthermore, the review followed rigorous search and screening procedures including the use of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA). However, the review is limited to a small sample of eight studies, which are reported to be weak in quality and focused only on glycemic control (A1C) (Sherifali et al., 2016).

In 2017, Sherifali further reviewed the findings of the systematic review described above to construct a conceptual model for diabetes health coaching, outlining its essential components (Sherifali, 2017; Sherifali et al., 2016). The 12-item Template for Intervention Description and Replication (TIDieR) checklist was used to determine the characteristics of the eight health coaching interventions allowing for comparisons among them (Hoffman et al., 2014). The trials were all conducted in different countries representing diverse healthcare systems, values, and beliefs regarding health and wellness, and approaches to diabetes self-management (Sherifali, 2017). Sherifali (2017) identified that while all health coaching interventions remained inconsistent in components, all had incorporated the provision of goal-setting skills, diabetes education,

customized care tailored to individual needs, and frequent follow-ups. Moreover, coaches utilized a range of various techniques including but not limited to a combination of active listening, understanding the patient's goals, and acknowledging and addressing the patient's beliefs, values, and readiness for change (Sherifali, 2017). All eight studies had incorporated the use of diabetes education within their coaching intervention and seven had a behavioural component (Sherifali, 2017). Four of the eight studies reviewed had utilized a nurse as the coach and the delivery used combinations of various technological platforms as described above. All the studies had provided customized coaching where participants received different elements of the intervention in varying arrangements, tailored to their individual needs, discussions with the coach, and physical assessments (Sherifali, 2017). However, only one study had conducted any fidelity testing to evaluate whether the coaching intervention had been implemented as intended throughout the study. As such, it remains difficult to discern how the coaching interventions may have been modified during delivery. The proposed conceptual model for diabetes health coaching can be found in Figure 1.

Following this, Pirbaglou et al. (2018) conducted a more recent systematic review of 22 randomized controlled trials between 1990 and 2017. They conducted this review to evaluate the effect of health coaching on both glycemic control and psychological outcomes in adults who are self-managing T2DM. The selected articles within this review examined health coaching interventions that assisted clients with developing self-management goals, provided support with their self-efficacy as well as, monitored and addressed barriers to adequate self-management (Pirbaglou et al., 2018).

Similar to the work of Sherifali et al. (2016), the review evaluated health coaching interventions that varied in the mode of delivery, follow-up durations, and theoretical foundations. The delivery modes of the health coaching interventions varied in combinations that included face-to-face, electronic patient monitoring programs, and telephone (Pirbaglou et al., 2018). The programs further varied in frequency, duration, and time intervals between contact with the coach.

Similar to the findings of Sherifali et al. (2016), coaching sessions lasted anywhere from 15 to 120 minutes in duration and were provided anywhere from a weekly basis to every three months. Across studies, personal health coaching interventions were provided anywhere from a total of two to eighteen months. Health coaching was delivered by various professionals including but not limited to nurses allowing for many variations in training and approach (Pirbaglou et al., 2018). Pirbaglou et al. (2018) also noted that the interventions were structured around different theoretical frameworks such as motivational interviewing, chronic care model, cognitive behavioural therapy, self-efficacy theory, and social cognitive theory, while some had not referenced a single framework.

The meta-analysis conducted by Pirbaglou et al. (2018) found PHC interventions to have an overall favourable impact on A1C levels (-0.50%) with the greatest differences after 4 to 6 months of personal health coaching. No statistically significant differences were found when the professional background of the coach, mode of coaching delivery, and theoretical foundation for the interventions were controlled (Pirbaglou et al., 2018). The authors highlight that the reductions observed align with current targets of clinical

significance. However, these reductions did not coincide with statistically significant changes in psychological distress, quality of life, or self-efficacy (Pirbaglou et al., 2018).

Strengths of the review include a wide search through available electronic databases, the use of the PRISMA for selection of RCTs, and evaluation of bias risks by three independent reviewers (Pirbaglou et al., 2018). A large limitation of the review is that a qualitative synthesis of specific psychological outcomes is not provided as indicated by authors in the abstract. As a result, only the effectiveness of PHC interventions on A1C is discussed resulting in a lack of insight into the experience of recipients. Furthermore, the review failed to provide information on adherence to medication regimens, changes in medications, the types, and frequency of self-management tasks required of participants, and other coinciding lifestyle changes that were made by participants (Pirbaglou et al., 2018). As a result, there is a limited understanding of possible external factors that may have impacted the effect of PHC. Overall, the use of health coaching as a behavioural approach alongside other lifestyle-based, educational and pharmaceutical interventions is valuable in assisting those with T2DM in adopting healthy lifestyle behaviours, which are required to manage the chronic illness well (Pirbaglou et al., 2018). The review concluded that further research is needed to determine effective program components and how coaching interventions should be optimally structured and delivered. While authors sought to expand on the work of Sherifali et al. (2016) by examining psychological outcomes, only a limited number of studies reported relevant measures with great variation in reporting scales.

Both systematic reviews to date that have examined the effectiveness of health coaching in T2DM have had a focus on glycemic control (A1C levels) (Pirbaglou et al., 2018; Sherifali et al., 2016). Both reviews have examined 24 RCTs collectively that have spanned across North America, Western Europe, Australia, and a few countries in Asia, reflecting diverse healthcare systems. Wayne, Perez, Kaplan, and Ritvo (2015) conducted the only RCT examining diabetes coaching within the Canadian healthcare system. However, their trial was a pragmatic, non-inferiority RCT examining the difference between diabetes coaching using mobile support against usual care. The intervention was led by unregulated healthcare providers trained in health coaching who had an undergraduate degree in either kinesiology or health sciences. A total of six coaches were utilized allowing for many variations in the delivery of the intervention. The results of the study found no significant differences in the reduction of HbA1C when mobile support was supplemented to the coaching intervention (Wayne et al., 2015).

More recently, Sherifali et al. (2019) published the protocol and baseline characteristics for a randomized controlled trial to evaluate the effectiveness of diabetes health coaching using the diabetes coaching model shown in Figure 1. In contrast to preceding trials, this RCT focused on evaluating the effectiveness of a structured model-based diabetes coaching intervention delivered by a single health coach among community-based adults living with T2DM. The coach is a regulated healthcare provider and certified diabetes educator with training in motivational interviewing, behaviour modification, and the diabetes coaching model (Sherifali, 2019). This is the first RCT to

examine the effect of a theoretically and evidence-informed diabetes coaching intervention in the Canadian healthcare context.

Study participants were recruited from different community health centres across Southern Ontario. The intervention group received the diabetes coaching via telephone for one year with recipients receiving a 10-15 minute call once per week for the first 6 months and once per month for the last 6 months (Sherifali, 2019). Both the intervention and control group continued to receive standard diabetes education at the community centres. Furthermore, both groups received accelerometers to track physical activity and continued to have access to community resources for self-management (Sherifali, 2019).

While the primary outcome was A1C, self-care behaviours, quality of life, and cost-effectiveness were also identified as secondary outcomes (Sherifali, 2019). Furthermore, this trial will also collect process outcomes including adherence of participants to the intervention and coach utilization. Utilization was measured by having the coach directly record how much time was spent on each component of the diabetes coaching model following every interaction (Sherifali, 2019). As a result, this trial will be able to better capture how diabetes health coaching is administered and used by recipients. It is anticipated that the findings of this trial will provide further support for the implementation of a model-based diabetes coaching intervention to better support Canadian adults living with T2DM (Sherifali, 2019).

The Experience of Receiving Diabetes Health Coaching

Most of the existing literature around diabetes coaching has focused on evaluating the effectiveness of its use on glycemic control and relevant clinical outcomes such as weight, cholesterol, body mass index and blood pressure, physical activity, and medication adherence. As the aforementioned reviews have found, there remains a paucity in the literature examining the effect of diabetes coaching on patient-relevant outcomes such as diabetes-related quality of life measures or self-efficacy. Moreover, there is a lack of qualitative studies examining the experience of recipients of this emerging intervention. As a result, it remains difficult to discern how individuals with T2DM are utilizing coaching to assist them with self-management needs. A highlight of the existing qualitative literature on diabetes coaching is discussed below.

Howard and Hagen (2012) conducted a phenomenological study to examine the experience of individuals with T2DM who have participated in a health coaching intervention. Study participants were recruited from a community-based chronic disease management program in Calgary, Alberta (Howard & Hagen, 2012). The health coaching had been provided by nurses who were trained in motivational interviewing, chronic disease management, and a health behaviour change approach developed by Rollnick, Mason, and Butler (1991). The approach was similar to the current health coaching definitions and is focused on the patient being the driver of change (Rollnick, Miller, Butler, & Aloia, 2008). The authors indicate that participants initially received two group education classes that provided support and education on self-management followed by subsequent, individual coaching sessions. Contrary to other studies, it is important to note

that the nurses had no specific training in diabetes management and there was a low frequency of contact with the coach as follow-ups were arranged anywhere from three to twelve months (Howard & Hagen, 2012). Furthermore, no details are provided regarding the training that was provided to coaches or how the coaching was delivered.

The findings of the phenomenological exploration revealed three major themes to describe the experience of participants with this particular health coaching approach. Three major themes were identified from participants' descriptions of their experiences with this coaching. Firstly, participants described that health coaching had been a "driving force" in which coaches worked with them to find their internal motivators for change. Secondly, they described the experience of "I'm not a child," which referred to participants wanting to maintain independence and control in relationships with the coach. Lastly, "meeting the inner coach," which referred to the notion of participants developing their knowledge and expertise (Howard & Hagen, 2012). These findings provided a preliminary glimpse into how recipients of diabetes coaching perceive their experience of working with a coach. The themes suggest a possible transition from exploring motivators for change to overtaking the role of the coach in guiding their behaviours. However, the findings of this study are limited due to a small sample size of three participants (Howard & Hagen, 2012).

Walker et al. (2011) utilized a grounded theory approach to examine the processes that took place in a telephone coaching intervention administered by nurses to individuals with T2DM in Australia. Participants were recruited from a larger RCT, the Patient Engagement and Coaching Health (PEACH) project. The RCT was designed to evaluate

the effectiveness of telephone-based SMS administered by nurses to clients who were identified to be poorly managing T2DM (Walker et al., 2011). Nurses in community-practice settings underwent two days of didactic training about nutrition, exercise, medication adherence regimens, testing protocols, and target glycemic levels. There was no indication of any theoretical foundations or motivational interviewing used for the coaching intervention. All coaches received the same training and were instructed to motivate clients to make lifestyle changes, follow medication regimens, and improve collaboration with their primary care physicians to meet clinical targets (Walker et al., 2011). In contrast to other studies, the intensity of the coaching intervention provided was minimal as participants received a total of eight calls over 18-months.

Walker et al. (2011) also analyzed data from 14 coaching sessions conducted by six different nurse coaches of the larger PEACH trial intervention group. Findings indicated that despite the use of various coaches, all calls had followed a similar semi-structured approach. Nurse coaches had asked all protocol questions regarding their medications, lab results, diet, exercise, and clients were given suggestions on areas of improvement. Wherever clients had not been able to meet clinical targets, nurses had provided additional information and support to guide them. Moreover, Walker et al. (2011) found that coaching calls took place within complex social contexts unique to each client in which, individuals managing T2DM were continuously balancing their health with all other aspects of life. Often, this included coinciding health concerns (Walker et al., 2011). Within their larger social context, participants failed to prioritize certain health demands as they valued remaining “normal” at work and in their relationships. As a

result, coaches varied in the relationships they built with clients depending on their larger social context. Walker et al. (2011) identified that coaches had taken on either a "treat to target" or "personalized care" approach with participants thereby shaping the relationships they had. Nurse coaches who used a "treat to target" approach had focused their discussions around assisting participants to meet and maintain behaviours that would meet set targets. Alternatively, nurse coaches who used a "personalized care" approach engaged in discussions around other external life factors and the influence they played in a participants' ability to achieve specific targets. Walker et al. (2011) were unable to evaluate the impact of the different coaching styles identified on both health and psychosocial outcomes of the larger PEACH trial, as this could not be identified. They suggest that future research should seek to gain a better understanding of the relationships coaches form with participants within their unique social contexts and its influence on clinically significant outcomes (Walker et al., 2011).

Dellasega et al. (2012) explored the use of motivational interviewing alone to promote positive behaviour change in individuals with T2DM in the U.S. They conducted four focus group interviews that included a total of 19 adults with T2DM who had received motivational interviewing as part of a larger 2 year RCT. Three Registered Nurses with four months of training in T2DM knowledge content and motivational interviewing delivered the intervention (Dellasega et al., 2012). The training was provided using interactive teaching methods and motivational interviewing. A certified psychologist assessed fidelity. Participants met in-person with their nurse coaches every three to six months for a 1-hour session and further, had the opportunity to contact them

via e-mail and telephone in-between visits. To capture a diverse sample, some were also recruited from a low-income primary health clinic (Dellasega et al., 2012). The following five major themes emerged from the study regarding the participants' experiences with a motivational interviewing intervention: non-judgmental accountability which encouraged open dialogue and responsibility for their care; being heard and responded to as a person; encouragement and empowerment through empathy; collaborative action planning and goal setting in which they developed a partnership with the nurse; and coaching rather than critiquing (Dellasega et al., 2012). Limitations of the study included possible participation bias as none of the participants provided any negative feedback. The findings of the study provide support for the use of motivational interviewing techniques in health coaching interventions to establish better communication and rapport with clients (Dellasega et al., 2012).

Fazio et al. (2018) looked at the experience of adults with T2DM who participants in a technology-enabled nurse-led health coaching trial in the United States. The intervention consisted of 6 bi-weekly nurse-coaching sessions and the use of personal health tracking technology. Again, nurses were trained in motivational interviewing. They used a qualitative description to explore the different types of successes experienced by participants who had received the intervention. Participants experienced positive changes in the following 5 areas: health behaviours, mindset, and awareness, engagement with healthcare resources, health indicators, and physical or emotional health (Fazio et al., 2018). Participants' defined changes in health indicators as positive numerical changes in diabetes-related clinical measures such as HbA1C levels, weight loss, or reduced intake

of insulin (Fazio et al., 2018). Positive changes in physical or emotional health were described as feelings of accomplishment, increased self-control with self-management, feeling more fit or attractive, and increased strength and energy (Fazio et al., 2018).

The strengths of the study include having a large sample of 132 cases; this constitutes a large sample in qualitative health research. Secondly, the authors comprehensively reviewed both nurse coaching notes and participant reflections as sources of data (Fazio et al., 2018). However, the findings remain limited as the study was an analysis of self-reported data, the authors did not interview further to clarify findings and included nursing documentation which may have introduced bias. As a descriptive study, the findings remain limited in exploring the depth of success in regards to behaviour change, which participants may have experienced (Fazio et al., 2018). Further, it is difficult to discern whether the interactions with nurse coaches or the use of technology had a greater effect in facilitating the health changes reported. Nonetheless, the range of positive experiences reported by participants suggests that success for participants ranges far beyond common clinical outcomes that are measured including glycemic makers (Fazio et al., 2018).

McGloin et al. (2015) conducted a mixed-methods case study to examine both the effectiveness and experience of receiving a health coaching intervention for T2DM in the United Kingdom. The intervention evaluated in this study was telephone-based and delivered through Skype calls every week for a month followed by bi-weekly calls for an additional eight weeks. The professional background of the coach was not specified.

Strengths of the study included the triangulation of various sources of data including physiological measures (HbA1C, blood pressure, weight, BMI, and waist circumference), self-reported survey data (physical activity, self-efficacy, emotional distress, and readiness for change), and focus group interviews exploring the experience (McGloin et al., 2015). No significant change in HbA1C levels or blood pressure was found. A significant short-term decrease in weight and waist circumference was found at three months. Also, there was a significant increase in the daily expenditure of participants at three months but was not sustained. McGloin et al. (2015) conducted a thematic analysis of both the last call between coaches and participants, and focus group interviews. Themes from the last call with participants found that participants described the process of change and need for prolonged support to sustain changes, faced lapses in the behaviour change process, met behaviour change goals to receive reinforcement from the coach, and were continuously met with ambivalence around making changes (McGloin et al., 2015). Focus group data found that individuals felt they made improvements regardless of measures by feeling better, more fit, and energetic but desired prolonged support. Findings further indicated that the key components of good coaching requires encouragement, no judgement, empathy, choice, and active listening (McGloin et al., 2015). The study was limited due to a small sample size as only eight participants completed the full intervention and inclusion criteria is not specified. Lastly, two focus groups have been conducted following the completion of the intervention but only included five of the participants along with two of their family members (McGloin et al., 2015).

Lastly, a single descriptive qualitative study was found exploring the experiences and perceptions of clients with a health coaching intervention as part of their ongoing care at three primary health care clinics in Ottawa, Canada (Liddy et al., 2015). Semi-structured interviews were conducted with 11 adults who were either at risk for or already diagnosed with T2DM and enrolled in a health coaching pilot study. A total of six coaches were provided with 11 hours of training in the Peers for Progress model, skills from the transtheoretical model of behaviour change, and motivational interviewing techniques (Liddy et al., 2015). It is important to note that Peers for Progress is a model developed for peer support among those with chronic conditions and was adapted here for the use of health professionals to use for T2DM. As three of the coaches had prior training in motivational interviewing and three had been certified diabetes educators, there may have been variation in both pre-existing expertise and the delivery of the intervention. A stratified sampling approach was used and providers sought to include participants who they felt would benefit most from this intervention; those who had not utilized any of the standard support and care programs (Liddy et al., 2015).

Participants from the intervention group had an initial face-to-face meeting and subsequently, had access to a health coach for six months. They were allowed to coordinate biweekly meetings with the coach over e-mail, telephone, or in-person for 30 to 60 minutes (Liddy et al., 2015). While they were recommended, subsequent coaching sessions were not mandated leaving variability in the frequency of contact that participants had with their respective coaches. Liddy et al. (2015) found that participants described an overall positive experience from the health coaching intervention. The

results of the study indicated that participants had an increased awareness of diabetes-related health, accountability for their health-related behaviours, and access to care and health resources (Liddy et al., 2015).

Gaps in the Literature

Over the last decade, there has been a surge in the available literature regarding health coaching. Across studies, health coaching interventions have varied greatly in theoretical foundations, structure, delivery, and application (Olsen & Nesbit, 2010; Wolever et al., 2013). Consequently, there continue to be differences in the definition, operationalization, and implementation of health coaching. Nevertheless, health coaching appears to be a patient-centered intervention focused on motivating clients to become actively engaged in their health behaviour changes (Wolever et al., 2013). Throughout the literature, it is apparent that motivational interviewing techniques are a key component of health coaching (Olsen & Nesbit, 2010). Similarly, diabetes health coaching interventions also show variation in training, structure and delivery. Systematic reviews have found diabetes health coaching is effective in improving glycemic control and reducing A1C levels among adults with T2DM (Pirbaglou et al., 2018; Sherifali et al., 2016). However, they have not been able to conduct meta-analyses on patient-relevant outcomes due to underreporting in measures such as quality of life and psychosocial outcomes. Although limited, existing qualitative studies suggest that patients' positive experience with diabetes health coaching extends beyond glycemic management alone and should be further explored to provide holistic care that can meet the needs of clients.

Theoretical Application

Ajzen's (1991) theory of planned behaviour (TPB) (Appendix B) was selected as a framework to explore the participants' experience with behaviour modification while receiving diabetes coaching. The TPB was developed to both predict and explain human behaviour in a given context (Ajzen, 1991). It was developed to explain behaviours over which humans can exert control including those related to health. Ajzen (1991) postulates that performing any behaviour is determined by both an individual's intention and actual control over it. The intention to perform any behaviour is determined by an individual's attitude towards the behaviour, subjective norms and their perception of control in a given situation (Ajzen, 1991). Attitude refers to the favourable or unfavourable appraisal that one may give to the behaviour, subjective norms refers to the societal perceptions of performing the behaviour, and perceived control refers to the ease or difficulty that an individual expects (Ajzen, 1991). Individuals tend to hold positive views on behaviours that are associated with positive attributes and lead to favourable outcomes such as low costs and better glycemic control, respectively (Ajzen, 1991). The influence of social norms (normative beliefs) depends on who an individual may look up to or value and whether they would approve or disapprove of the behaviour. Beliefs around perceived control are influenced by one's own past experiences, the experiences of those around them, and any external factors that either increase or minimize the perceived difficulty of performing the behaviour (Ajzen, 1991). The concept of perceived behavioural control further encompasses the construct of self-efficacy developed by Bandura (1991), which states that maintaining a given behaviour is dependent upon one's confidence in their

abilities. The perception of acquiring both resources and opportunities and a lack of barriers will lead one to believe they have greater control over a given behaviour. The relative influence of all three may differ across various behaviours and situations (Ajzen, 1991). For the following interpretive descriptive study, components of the theory have been embedded in the semi-structured interview guide to explore the experience of participants to these concepts in greater detail.

Conclusion

An RCT to evaluate an evidence-based diabetes health coaching intervention among community-based adults with T2DM within the Canadian context was recently completed (Sherifali et al. 2019). This RCT was based on a structured diabetes health coaching intervention delivered by one professional advanced practice nurse coach using only the telephone and moderate level of contact over one year (Sherifali et al., 2019). The consistency and decreased variability in the training and delivery of coaching provides a unique opportunity to explore the perceived experience of participants when these influences remain constant. The application of Ajzen's (1991) theory of planned behaviour allows for further insight into participants' experience with making self-management behaviour changes while receiving diabetes coaching. Present qualitative literature remains limited due to small sample sizes, use of self-reported data, and great variation in coaching training and delivery. As a client-centered intervention that supports individuals in their healthcare journey, it remains imperative to have a deeper understanding of how individuals with T2DM perceive and utilize diabetes health coaching.

The following interpretive description is a substudy of the completed RCT conducted by Sherifali et al. (2019) that will seek to capture the experience of receiving diabetes health coaching in greater detail. The findings of the study will expand our understanding of how these individuals come to experience and utilize an evidence-based diabetes health coaching intervention. This exploration will seek to better understand how this intervention may be able to inform and support clients optimize their self-management.

Chapter Three

Research Question and Methods

Research Question

What is the perceived experience of diabetes coaching among community-based adults over the age of eighteen diagnosed with T2DM following a 1 year, telephone-based coaching intervention?

Study Design

This study was guided by Sally Thorne's (2016) interpretive descriptive methodology. It is an approach for qualitative research within an applied discipline such as nursing where the purpose stems from a real-world issue, is based upon empirical understanding, and findings are meant to serve a target audience within a specific contextual setting (Thorne, 2016). This methodology is not a novel or unique approach to qualitative research distinct from other traditions. Rather, this approach encourages the researcher to borrow design techniques from other traditions as appropriate to the research question being explored. It grants researchers the freedom to move beyond the rigid structures imposed by more traditional methods to better align with applied research aims (Thorne, 2016). This methodology is geared at research questions derived from clinical practice problems with the intent to acquire empirical disciplinary knowledge. Interpretive description supports the use of a literature review to build a case for the researchable question as has been done to support the need for this study (Thorne, 2016).

It is expected that healthcare professionals with exposure and experience in managing diabetes will optimally deliver a diabetes health coaching intervention. As

identified in the literature, nursing and especially, those certified in diabetes education would be ideal in providing coaching services. As such, the findings of this exploration would be particularly applicable to nursing practice and supported by an interpretive descriptive design (Thorne, 2016).

The chosen research design further recognizes and values the researcher's former knowledge and experience with the subject as a foundation in qualitative exploration (Thorne, 2016). Therefore, this design has captured the clinical nursing lens that I have brought to this inquiry while co-creating meaning for the experiences being explored. As a Registered Nurse, I bring forth clinical experience in understanding not only the pathophysiology and treatment plans involved but also, the challenges faced by this population within our healthcare system. Most recently, having completed a practicum alongside an advanced practice nurse and certified diabetes educator, I have been able to gain greater insight into the challenges of providing sustainable diabetes education as well as, the gaps that exist in supporting these individuals within the community. Furthermore, I bring forth a personal lens from having interacted with family members diagnosed with T2DM and bearing witness to some of the daily trials of maintaining healthy behaviours and managing the condition well.

Moreover, this methodology aligns with my social-constructivist worldview corresponding with the notion that there are many truths, which are subjective to an individual's reality and perception of the world based on experiences (Creswell, 2013). Interpretive description allows the researcher to collaborate closely with participants to co-create an understanding of the phenomenon of interest through dialogue (Thorne,

2016). Thorne (2016) highlights the importance of restraint in the generalization of findings and the practice of ongoing reflection to denote the influence of one's setting and situation when constructing data. Reflexivity through journaling was employed during both data collection and analysis to account for the biases of the researcher (Creswell, 2013; Thorne, 2016).

Much of the literature to date has used solely qualitative descriptive methods. The use of interpretive description for this study will allow for an extension of the inquiry beyond the level of description, capture individual participant voices and the variation in experiences that exist (Hunt, 2009). The co-construction of meaning in this study allows for a clearer conceptualization of how diabetes health coaching is experienced by clients and maybe improved in current nursing practice.

Setting.

Participants of the study were enrolled from the larger RCT by Sherifali et al. (2019). The RCT examined the effectiveness of a diabetes coaching intervention on adults with T2DM from community diabetes program situated in Southern Ontario. A total of five CHCs that regularly provide diabetes education to individuals with T2DM within the region were included. Participants enrolled in the RCT were assessed and followed at one of the CHCs. As such, participants for the proposed qualitative study were recruited from the CHC site while completing their final follow-up assessment.

Sampling.

A purposive sampling approach was employed in recruiting participants for this study (Thorne, 2016). Purposive sampling involves selecting specific participants who

have experienced the phenomenon of interest and often, requires a key informant who has access to this population for recruitment (Thorne, 2016). For this study, participants were recruited using the research coordinator for the larger trial as the key informant. Only participants already enrolled in the study that were randomized to and had received the diabetes coaching intervention were recruited. This aligns with the research question and aims of the study, as findings can only be gathered from those who have experienced the phenomenon of interest (Thorne, 2016). The research coordinator connected directly with the diabetes coach to assemble a list of potential participants. In doing so, the research coordinator was able to gain insight into which participants may or may not have completed the coaching intervention, had positive or negative outcomes, and other unique challenges to explore a range of experiences.

Participants met the same inclusion and exclusion criteria that were applied to the larger trial. However, participants also had to be enrolled in the diabetes coaching intervention group. By following the methods of the larger coaching trial, participants for the present study needed to meet the following inclusion criteria: adults aged 18 years or older, have a diagnosis of T2DM, an A1C of 7.5% or greater to select for those who would benefit the most and have access to a telephone line. Furthermore, participants were required to speak, read, write, and understand English. Individuals were excluded if coaching was not appropriate for other reasons such as cognitive impairments, if participants were pregnant or had any other underlying medical conditions that would alter A1C readings, or if they were cohabiting with another participant. As participants were selected from the larger trial, they had already met these inclusion and exclusion

criteria. As such, all eligible participants already had access to a telephone line and met the English language criteria required for recruitment, consent, and participation in interviews.

Sample size.

Thorne (2016) does not specify a particular sample size when using an interpretive description research. Thorne (2016) suggests that it is appropriate to remain flexible with sample size given the subject being explored and the occurrence of the phenomenon. Similar to phenomenology, interpretive description also aims to better understand the experience of individuals to a particular phenomenon (Creswell, 2013). Based on recommendations from phenomenology, a sample size of approximately 15 participants was set for this study to gain a rich understanding of the experience amongst those who received the diabetes coaching intervention. This sample size was settled upon following deliberations with the thesis committee and consideration for the available pool of participants, time constraints, available resources, and feasibility.

Recruitment.

Upon receiving ethics approval (Appendix C), participants who were randomized to the RCT intervention group and had received diabetes coaching were asked if they are interested in participating in a subsequent qualitative study by the research coordinator of the larger trial. A list of participants who indicated their interest was organized with names and telephone numbers. Additionally, participants who had completed the larger trial earlier on were also contacted via phone by the RCT researcher coordinator to see if they would be interested in returning for a subsequent study.

Participants who indicated their interest were given a follow-up phone call by the researcher to go over the purpose, aims of the study, and the commitment to an approximate one hour interview (Please see Appendix D for telephone recruitment script and Appendix E for the letter of information/consent). Study participants who completed the telephone interview were reimbursed with a gift card as appreciation for their time and contributions to the study. A total of 44 participants agreed to be contacted for a subsequent study. Although the length of time given to recruitment was initially set for four months, this was extended to seven to reach the desired sample size and include an array of experiences. Participants were recruited from January 2018 to August 2018. A total of 12 participants were enrolled in this study and completed full interviews. Participants who provided consent to participate were given an opportunity to reschedule interviews if needed. All participants who were scheduled for an interview were called a minimum of two times before being dropped if they were not reached.

Data collection.

In-depth interviews with participants constituted the primary form of data collection and this data was additionally supported with demographic data and reflexive journaling by the interviewer (Creswell, 2013). Comprehensive, personalized accounts of the participants' experiences with coaching were explored (Thorne, 2016). Interview questions remained open-ended and utilized prompts when needed to ensure that a strong rapport was built with participants. This dialogue leaves room for elaboration, clarification, and correction of the researcher's initial understanding and interpretations

(Thorne, 2016). The semi-structured interview guide included concepts gathered from the TPB, which can be found in Appendix D.

Research participants were provided with a brief explanation of the purpose of the study and invited to participate in a one-hour interview. Interviews ranged anywhere from 30 to over 90 minutes in duration and this flexibility was provided by the researcher where appropriate.

As participants were located across the Southern Ontario region, conducting in-person interviews with participants were not feasible due to long commutes and lack of a common setting. Interviews were conducted over the phone to provide convenience and time efficiency in data collection. Literature supports that telephone interviewing may be just as effective as in-person with no significant differences in transcripts (Sturges & Hanrahan, 2004). It has been found that interviews over the telephone provide participants with the opportunity to more readily choose a place and time that is comfortable and convenient allowing for more relaxed dialogue (Sturges & Hanrahan, 2004). The use of telephone interviewing is further supported for this proposed study, as participants were already comfortable with conversing over the phone through their regular phone calls with the diabetes coach. The full semi-structured interview guide that was employed can be found in Appendix F. It is important to note, that the researcher probed outside this structure depending on the responses that arose.

Interpretive description heavily values dialogue and the repetitive examination of interview data (Thorne, 2016). All interviews were audio-recorded and transcribed afterward verbatim with consent from participants obtained beforehand. All recordings

were saved in a password-protected file on the laptop and original recordings will be erased. Non-verbal features of communication including long pauses, changes in tone, and emotional cues were also transcribed were applicable to capture all aspects of dialogue. All interviews were conducted and transcribed by the researcher and all data collection was completed in August 2018.

Demographic details including participant age, gender, number of years diagnosed with T2DM, medications, and use of insulin, and baseline A1C were also collected. Alongside demographics, some background information in regards to spousal/familial support, occupation, other diabetes support resources, and other chronic conditions were gathered (Appendix G). This data was used to capture a preliminary description of the participants and their context. This will be valuable when seeking to both understand and transfer study findings (Creswell, 2013).

The researcher engaged in regular reflexive journaling when not interviewing to consider ongoing thoughts, questions, and biases. Engaging in reflexivity allows the researcher to become aware of their preconceptions, challenge their own bias, and allows any factors that may be prohibiting the understanding of the phenomenon to emerge (Watt, 2007). It allows the researcher to understand how they came to abstract things the way they did. Moreover, the researcher engaged in memoing by taking short notes of emerging ideas and thoughts as they came throughout the process, which is appropriate as the analysis of data coincides with the collection phase (Thorne, 2016; Watt, 2007). The use of reflexivity is integral to the interpretive descriptive methodology, which is

designed to capture the clinical insights and interpretations of the researcher (Thorne, 2016).

Data analysis.

Similar to many other qualitative designs, data analysis in interpretive descriptive commences alongside data collection and began immediately, following the first interview (Thorne, 2016). To facilitate this process, interviews were transcribed and reflexive journaling for each interview coincided immediately afterward. Although two weeks were allotted for this process between interviews, this was not always feasible given that often, more than one interview had to be scheduled on a single day to accommodate schedule conflicts. As data analysis took place parallel to data collection, this allowed for questions to be modified in later interviews to clarify and develop emerging themes. NVivo10 software (QSR International, 2015) was used to organize transcripts, memos, and emerging codes for this process.

As suggested by Thorne (2016) and Bazeley (2013), an initial step to understand the contextual background of participants was taken by first examining their demographic data. Thorne, Kirkham, and O'Flynn-Magee (2004) caution researchers to avoid line-by-line coding when taking this approach as the researcher's goal is to better understand the overarching conceptualization and patterns which can be overlooked if too much attention is given to numerous and irrelevant details. Thorne (2016) suggests that researchers should begin by engaging with the data in a less restrictive and more creative manner than the traditional approach of coding. As suggested by Thorne (2016), the researcher initially spent time becoming familiar with the interview data by reading and re-reading

transcripts in a tactile manner and making marginal notes highlighting possible linkages before coding. This was an iterative process of questioning the data and making interpretations. This approach allowed the researcher to remain broad in the relationships that emerged and avoided categorizing data prematurely as advised by Thorne (2016). As interpretive description remains a design for applied clinical practice research, Thorne (2016) recommends that researchers regularly practice disciplinary scaffolding meaning they should return to the clinical practice aims of the proposed investigation. As such, the researcher regularly returned to the data asking, "what does this mean to clinical practice?' by the researcher and by other members of the research committee throughout the coding and analysis process.

As proposed by Thorne, Kirkham, O'Flynn-Magee (2004), Morse's model of comprehending, synthesizing, theorizing, and re-contextualizing knowledge was applied in data interpretation. The model outlines stages of cognitive processing that gear the researcher through a structured thematic analysis (Thorne, 2016). The initial step of comprehending data entails familiarizing the data, which commenced during the data collection phase. During this time, the researcher repetitively listened to audio recordings and read over transcripts iteratively. This provided an opportunity for the researcher to immerse in the data and become aware of deeper messages within the language (Thorne, 2016). Following this, transcripts were repetitively reviewed by the researcher in collaboration with the research team to enhance the critical questioning of the data and gain new perspectives of the stories being presented.

Synthesizing data involved making notes while repetitively reviewing the interview data and highlighting potential initial themes (Thorne, 2016). The use of jot notes in this manner was a part of practicing reflexivity, ongoing questioning, and critical examination of the data. Repetitive listening and reading of the interview data before any initial coding began prevented premature closure resulting in superficial findings (Thorne et al., 2004).

In theorizing the data, the researcher revisited the data and initial thoughts and impressions from a broader view (Thorne et al., 2004). During this stage, the researcher examined all interviews and data as a whole searching for overarching patterns and concepts by asking questions like, "what is happening here?" Thorne et al. (2004) suggest that it is important for the researcher to examine their biases through reflexivity when making interpretations, as these interpretations are the driver for final conceptualizations in this method. In doing so, the researcher aimed to develop a higher-level understanding of the data presented by reflecting upon the lenses brought to analysis while considering various possible answers to the clinical question being addressed (Thorne, 2008). To facilitate this, two separate meetings were held with the research committee to present the initial themes that had emerged from the initial stages of coding and subsequently, to revisit these themes for more accurate interpretation. As a novice researcher, these meetings provided guidance and feedback from more experienced qualitative researchers during interpretive coding processes. Also, several discussions took place between the researcher and supervisor before establishing the final themes.

Lastly, re-contextualizing the interpretations that have been made involves applying them to a clinical setting and acknowledging the limitations of the data (Thorne, 2016). This is achieved by providing complete transparency regarding the context of participants, research design, and the decisions made during analysis (Thorne, 2016). Re-contextualizing the findings allows the researcher to better understand how they may be transferable to other contexts including other health coaching initiatives in different settings. The re-contextualization of data findings will be presented in the discussion chapter of this thesis.

Rigor and Trustworthiness

The model developed by Lincoln and Guba (1985) was employed to strengthen the overall rigor and trustworthiness of this study. The model is comprised of four key elements, which are credibility, transferability, dependability, and confirmability as detailed below (Schwandt, Lincoln & Guba, 2007).

Credibility.

Credibility ensures truth-value to the research inquiry being pursued and is a measure of how well the findings captured would hold true amongst others who have received diabetes coaching (Thomas & Magilvy, 2011). The researcher strengthened the credibility of findings using data triangulation, peer debriefing, and member checks (Schwandt, Lincoln & Guba, 2007). Data triangulation among all sources of data including interviews, field notes, and reflexive journal entries was used to assess whether consensus exists (Schwandt, Lincoln & Guba, 2007). The researcher's thesis committee served as a panel of experts with valuable experience in qualitative research and were

able to review and assess the quality of analysis conducted and findings that emerged. Lastly, an altered approach to member checking was employed that aligns with the interpretive description design. The researcher conducted two check-in points for each interview, both in the middle and at the end to summarize participant responses. By doing so, the researcher was able to confirm the essence of participant experiences that were captured (Thomas & Magilvy, 2011). It is not essential for participants to approve interpretations made by the researcher when using this design and as such, not necessary for the researcher to conduct subsequent interviews to validate the findings (Thorne, 2016).

Transferability.

Qualitative research does not seek to generalize findings to a larger population but rather requires readers to determine if they are transferable given the contextual background of the sample (Lincoln & Guba, 1985). The researcher increased the transferability of the study by providing a thick rich description of both the sample and context so that readers can make better decisions in the application of the findings (Schwandt et al., 2007). This will include providing demographic and background data about the sample while maintaining the anonymity of participants, details of the diabetes coaching provided, and contextual information about the setting of the study (Thomas & Magilvy, 2011).

Dependability.

Dependability refers to the clarity of the research design and how well the findings can be replicated by others (Thomas & Magilvy, 2011). Providing details of the

study including those regarding the research design and analysis process highlights this. Furthermore, the researcher triangulation with the involvement of the full research team in decisions around design, recruitment, data collection, and analysis has further strengthened this step. The similarity of the findings to previous qualitative work further increases the dependability of the findings presented.

Confirmability.

Lastly, confirmability refers to the determination of whether the findings are truly representative of the participant's experience of the phenomenon (Thomas & Magilvy, 2011). As mentioned earlier, the researcher has practiced reflexivity throughout the research process to meet this objective. By regularly journaling thoughts, perceptions, and biases, the researcher has sought to maintain a sense of constant awareness and openness to findings as they unfold (Thomas & Magilvy, 2011). All four components of Lincoln and Guba's model have been applied to the research process to maintain rigor within this study.

Ethical Considerations

This study received ethics approval from the Hamilton Integrated Research Ethics Board (HiREB) in December of 2017 (Appendix C) before participant enrollment. This provided assurance that the researcher continues to maintain professional accountability for the wellbeing of all participants within the study by minimizing any harm and providing a thorough explanation for decisions made.

Informed verbal consent was obtained from all participants before being enrolled in the study by the researcher over the phone. The consent briefly outlined the purpose

and structure of the study including the commitment that participants would be required to make in terms of time and attendance for interviews (Creswell, 2013). The researcher ensured that all participants understood that enrolment was voluntary and the consent process was ongoing. As such, participants were permitted to stop interviewing at any time and were reminded of this mid-way into each interview. All participants were informed that they had the freedom to withdraw from the study at any given time (Creswell, 2013). Participants were made aware that should they withdraw at a later time, they must request to have any data removed no later than September 2018, before the write-up of findings.

Participants were e-mailed a copy of the consent form and required to review it and provide a completed copy with an electronic signature to a secure e-mail address. Alternatively, participants who did not have access to a computer and Internet access received a printed copy of the consent along with a pre-stamped envelope to provide written consent as well.

As this study explored the experience of participants who received a diabetes health coaching intervention, it was anticipated that interviews would cover sensitive information. Participants often disclosed details regarding their health challenges and needs. The confidentiality of participants has been protected by removing all identifiers including name, age, and other personal details (Creswell, 2013). All participants were assigned a participant ID code for forms, file names, and transcripts. Following this, a pseudonym was given to each participant to describe contextual backgrounds in the write-up of findings. Participants were made aware that interviews were being audio-recorded

and transcribed for data analysis when providing consent. All interview audio recordings were stored on the researcher's password-protected laptop in an encrypted folder and original recordings have been deleted. To maintain a professional relationship with participants and protect anonymity, all telephone interviews were conducted from a private, blocked phone line. Participants were provided with an e-mail address set up for the study if they needed to contact the researcher afterward with any additional questions, concerns, or additional thoughts.

The researcher is a Registered Nurse who did not provide any direct medical assistance and this role was made transparent to participants to avoid any role blurring between clinician and researcher functions. If participants did share any information that would have raised concerns regarding their diabetes management or overall, health and well-being, the researcher was to attain and connect them with the appropriate resources. However, no concerns among the 12 consenting participants arose. Lastly, it is important to note that while the participants of this study had received the diabetes health coaching intervention, all participants of the larger trial including both the intervention and control arms had equal access to standard diabetes care and support programs.

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Chapter Four

Findings

This chapter focuses on the findings and is organized into separate sections to provide details of the participant population and their unique geographical context, followed by their experiences with diabetes coaching. The chapter begins with a description of the recruitment methods and context, as well as participant demographics. This chapter will conclude with an exploration of the four main overarching themes that constitute the findings. Descriptions of overarching themes will include direct quotations provided by participants. It should be noted that all participants have been given a pseudonym to maintain confidentiality and privacy.

Recruitment Methods and Context

Recruitment started in January 2018, was extended by four months to obtain an appropriate sample of 12 and was completed in August 2018. Recruitment ceased when no new themes emerged following the last three interviews. This is in alignment with the interpretive descriptive methodology employed, which does not impose data saturation as a necessary parameter that needs to be met (Thorne, 2016, pp.107-108). A total of 44 participants from the intervention group had provided consent to be reached for a subsequent study following their participation in the larger trial. The extension of the recruitment period was agreed upon amongst all members of the research committee to include unfavourable experiences. It is important to note that of the remaining 32 participants who did not participate in this subsequent study, approximately six had been identified by the research coordinator as having had a negative experience. An effort was

made to include participants who had reported an unfavourable experience by extending the recruitment phase. However, these individuals were found to repetitively miss or reschedule interviews and ultimately, did not complete a telephone interview. While those with negative experiences were not included, an additional prompt to the interview guide was added asking participants to identify who this intervention may not be appropriate for, to explore this experience.

Participants described their experience with diabetes coaching in various ways. These ranged from extremely positive experiences in which participants implemented numerous life-changing behaviours to those who were indifferent to the coaching experiences and had little to no change in diabetes self-management practices. Nine of the 12 participants stated that they had an overall positive experience, finding diabetes coaching to be beneficial to them in some way. The remaining three identified having had an indifferent experience.

Demographics of Study Participants

A total of 12 participants were interviewed. The overall sample comprised 66.7% (n=8) females and 33.3% males (n=4). The mean age was 62 years (SD= 6.91); participants reported living with diabetes anywhere from 2 to 38 years (SD=15.89 years) and half of the participants (50%) reported that they were being managed with a combination of both oral medications and insulin (Appendix H Table 3). A total of eight of 12 participants (66.7%) were married while the remaining four participants (33.3%) were divorced, separated, or single. Most participants had completed high school with eight of the 12 (66.7%) identifying that they had completed a post-secondary diploma or

degree. One-third of participants reported that they are currently still working full time and 41.7% reported as being fully retired (Appendix H Table 3). Overall, 50% of participants identified that they had some support at home whether from a spouse or older child, and descriptions of support varied from emotional support and small reminders to driving them to appointments.

Participants were from the Southern region of Ontario, Canada, and had access to a community diabetes program (Waterloo Wellington Diabetes, 2019). The program is standardized and offered at various CHCs throughout region. The program includes various education and support classes in nutrition, exercise, medication management, as well as regular diabetes follow-ups (Waterloo Wellington Diabetes, 2019). The program is facilitated by an interdisciplinary team of healthcare providers specialized in diabetes management including nurses, dietitians, nurse practitioners, and social workers (WaterlooWellington Diabetes, 2019). It is important to note, that eight of the 12 participants (66.7%) identified having used these services while concurrently receiving diabetes coaching. While participants varied in their use of services, all had the opportunity to access this program including a range of providers and classes. Access to this program for individuals with diabetes provides a unique context for participants and has been considered throughout the analysis of data and final interpretations.

Study Themes

The following four main overarching themes were interpreted from participant interviews: ***a) adapting to life with diabetes; b) heightened mindfulness of diabetes-related wellness; c) behaviour change guided by the participant; and d) Valuing a***

***supportive relationship*.** All four themes will be described in greater detail below with a discussion of linkages between themes where appropriate. The perceived experience of diabetes coaching amongst participants remains multifaceted and complex, governed by their unique contextual backgrounds.

Theme 1: Adapting to life with type 2 diabetes mellitus

Participants shared their journeys of adapting to life with diabetes. While participants may have entered the study at different points and adaptation processes were unique to individuals, the overarching theme of adaptation to life with diabetes was apparent. Adaptation in the context of chronic illness has been described as a long-term process that involves individuals coming to terms with their new reality of being diagnosed, abandoning any misconceptions, removing thoughts of hopelessness, and redefining a meaningful life (White, Richter & Fry, 1992). In alignment with this definition, participants shared how diabetes coaching facilitated their adaptation by changing their perceptions of life with diabetes, increasing their knowledge of diabetes-related wellness, and supporting their transition to insulin use.

Accepting the diagnosis of T2DM, and the associated implications, as a permanent part of life moving forward was a significant adjustment expressed by participants. Participants shared how receiving a T2DM diagnosis was associated with difficult emotions and experiences. Many participants felt that being diagnosed with T2DM meant deteriorating health, a reduced lifespan and poor quality of life going forward. Participants explained how they, "saw [their] mortality in front of [them] when [they] were told [they] had diabetes" (Jess) and "felt like [they were] going to die at some

point not very far down the road" (Jess). As a result, participants described "a roller coaster of emotions" (Jess) and "periods of uncertainty in how life would unfold" (Elaine) when reflecting upon their own outlooks on life after being diagnosed. Despite having been diagnosed with T2DM for several years, participants still identified that their perception of living with diabetes had been poor before receiving diabetes coaching:

> *They tell you that you have it now and you just suddenly feel like you're going downhill but I guess that's how it goes with all these things. My husband is a diabetic and I tried very hard not to also become one. I did everything I could. I was fighting it…I didn't want to have to do all that. I'm worried about being able to manage diabetes with the other chronic pains I have and still being able to work the same…it's just one more thing you know.* - Anne

Anne further explains how she was doubtful moving forward with her life and maintaining the same quality of life as she had before the diagnosis. Furthermore, she describes feeling a sense of failure in avoiding the diagnosis and holds herself accountable. Mark corroborated how the diagnosis was "a dirty little secret" that he chose keep from those around him including close family before diabetes coaching. These experiences also highlighted the misconceptions and stigmatizations that surrounded the diagnosis.

Participants shared how the diabetes coach helped change these perceptions as they became "aware of how important it was and by managing [their] medications and routine… there was no reason why [they] couldn't have a nice long life" (Mark). Working with the coach empowered some participants to take charge by reminding them "it can be reversed but it [was up to them]…rather than sitting there thinking [they] had a death sentence because [they] got diabetes" (Jess). For many participants, this

empowerment and shift in perspective came from increased knowledge and awareness received through diabetes coaching:

I finally learned what not to eat and what I should be eating and how that effects my numbers so it was a turning point…it was knowledge and you know, once you know about it, you can do something about it. — Anne

Many participants voiced that diabetes coaching had given them the chance to gain a better understanding of T2DM and how it can be self-managed well. This enhanced understanding allowed participants to regain control and adopt a more positive outlook on their life than what they initially held:

At one time, I felt like my time was going to be limited as far as the lifespan goes and now, I don't feel like there are any restrictions. As long as I look after myself and use what I know from coaching, there is no reason why I can't live a long happy life right. — Mark

For other participants, the knowledge received through coaching helped them to accept diabetes as a part of their lives: "it helped me accept the fact that you know, this is something I have for the rest of my life and I need to face it but it's not everything about me" (Elaine). Moreover, discussions with the coach validated their unique experience with the illness:

I was putting a lot of blame on myself or wondering like, what else is wrong with me, or my body kind of thing when I was comparing. I've learned to not compare so much because everybody is so different. I was always wondering like, oh…how come that person is only taking two metformin in a day…the coaching shed light on all the differences we all have. I have felt unique from the start and [coach] reassured me that it is and that's okay. – Elaine

In the above quotation, Elaine, the youngest participant, highlighted the importance of not only accepting the diagnosis but also their individual experiences. The trajectory of becoming diagnosed and experience with the required lifestyle changes, medication

adjustments, and understanding other probable influencing factors such as stress and genetics was unique to each participant.

While coaching did not always change their outlook, participants appreciated having the opportunity to address their perceptions with someone who understood: "it was nice to be heard...I feel like everybody else has it easy… maybe they're eating healthy but they're not going to hurt themselves for not doing it today and [coach] got that" (Bonnie). Additionally, participants felt the coach was reassuring and open to listening to their daily frustrations: "I hate lugging all the equipment and then I have to find somewhere to go to do all and it's not nice taking that stuff out at parties in front of family and he got it" (Martha). These feelings around diet restrictions and discomfort with perceived judgments for managing their diabetes was shared amongst other participants. The coach understood these challenges and supported participants through them.

A few participants who were previously self-managing well or were not required to adapt their life to the diagnosis did not share the same negative perceptions:

Honestly, I don't really find anything challenging about it. Like, I don't find that my life has changed drastically because of it and it's probably because I haven't needed to in order to manage. —Carrie

Carrie had been diagnosed with T2DM but was managed well on one oral medication and was previously, leading a very healthy lifestyle and did not perceive the adjustment to be challenging. Similarly, some participants were only required to make subtle lifestyle changes and had perceived control before coaching: "I don't really notice a difference. As

I said, you have to watch what you're eating so that [was] the most difficult part about it [was] paying attention to diet" (Andy).

Overall, participants varied in their perception of diabetes diagnosis and how it would impact their lives moving forward. This perception was influenced by the severity of the diagnosis and how much it altered their current lifestyle behaviours. Participants who reported a negative future outlook following their diagnosis felt that diabetes coaching helped them regain control over their lives. Discussions with the coach had assisted participants in addressing their misconceptions, fears, and perceived judgments around the diagnosis.

Secondly, participants described that adapting to life with T2DM involved acquiring extensive knowledge around diabetes-related wellness and access to the appropriate resources. It was essential for participants to bridge their knowledge gap to self-manage better. This included a better understanding of the pathophysiology of T2DM, the signs, and symptoms, potential complications, medications, and self-management. Both newly diagnosed participants and those who had been diagnosed for over ten years felt that diabetes coaching provided them with new knowledge in diabetes-related wellness.

The coach was able to offer an introduction to T2DM for newly diagnosed individuals in a supportive manner. This included an understanding of the pathophysiology of T2DM and how this diagnosis was going to further impact their health:

So in the sense of knowledge of diabetes and explaining how it works and how your body works, what's happening in your body that's causing the high sugar levels and

things like that, that was fairly new to me because I didn't understand how it worked in the body. —Elaine

Becoming diagnosed was "[frightening] because [one was] going into the unknown" (Jess) and many described having felt uncertain in "how to move forward on [their] own" (Bonnie). Participants highlighted how the abundance of information from the internet, healthcare providers and other resources made it challenging to identify the necessary knowledge:

If somebody were to come to you today newly diagnosed as being diabetic, where do you begin? What do you do? It's like starting a diet, what do I do? Where do I shop? How do I begin? What am I supposed to be eating? And I know that I mean by goodness, I am 56 years old, I should go on the computer and look it up but there's so much information out there. —Carrie

In contrast, many participants found the coach to be an expert and "someone to talk to that's going to have some answers or is at least, going to find out answers you needed" (Elaine), allowing them to access information tailored to their needs. Furthermore, the conversations were engaging and participants were "able to ask the questions [they] wanted" (Martha) and the coach was able to "explain to [them] about why this [was] happening and this is what [they] should do" (Lauren). Those "that were just diagnosed and needed help and guidance, didn't know what to do or what questions to ask" (Anne) found that the diabetes coach helped navigate how to adapt to life with T2DM.

Likewise, participants who had been diagnosed for several years also reported that working with the diabetes coach allowed them to gain further insight into T2DM and improved self-management strategies. Although he had been diagnosed for nine years and received diabetes education in the past, Ray described how he still had many misconceptions about healthy diet behaviours when he entered coaching:

I used to drink orange juice and I used to drink 2, 3 tumblers a day. And then when you see, the sugar levels in that…I never used to think about that. I used to think well, pure orange juice but there is a lot of sugar…So those types of things where you think you're doing well but then you find out that you're not. You know, there's a learning curve with all of that which I really enjoyed. – Ray

Aside from learning about diet and exercise, participants also learned about the proper use and management of their medications: "Before I was being coached, I was just taking all my medicine at one time in a handful first thing in the morning so that I get it out of the way, not realizing it had to be spread out" (Mark). Even amongst participants who felt they were previously self-managing well, coaching offered greater insight into how T2DM is linked with other health concerns: "I never knew before that your eyes could tell a great deal about your diabetic health" (Andy).

Several participants who had longstanding T2DM acknowledged that they had not taken the long-term implications of poor self-management seriously before diabetes coaching. They voiced that it was hard to take it seriously since the symptoms were not always visible: "I never felt bad, I wasn't tired or nothing…just going a million miles an hour and working and happy" (Ray). Working with the coach was a turning point for participants to understand the importance of adequate self-management for their long-term health:

I was so amazed about how much I didn't know about diabetes even though I had it for years. I don't think I ever took it seriously because when you're diabetic, it's not like you feel deathly ill or anything like that. You can still eat sugars and not realize you're slowly poisoning yourself. It's not like you eat a donut and you're going to pass out. It's a long-term thing you have to watch. – Mark

Furthermore, participants found that by increasing their knowledge of T2DM, they were able to improve their communication with other healthcare providers. Engaging in

regular dialogue with the diabetes coach allowed participants to feel more "comfortable asking questions and speaking up about [their] concerns" (Bonnie) and "knowing what questions to ask" (Jess). Some found that the discussions in-between their regular three-month follow-ups provided them with an "opportunity to better understand what my doctor was talking about because they don't always have time to explain everything during your appointment" (Anne). As such, participants felt more empowered and better able to self-manage. This is articulated particularly well by the participant below when prompted to reflect upon the benefits of having received diabetes coaching:

I learned to speak the language of diabetes. Before when I was on my own, I didn't talk about it so if people asked me a question, I wouldn't even know how to answer them. I didn't even know what I needed to be asking about. With [coach] and this interaction and talking about medications and diet and exercise…you kind of learn to walk the walk and talk the talk. You become a better diabetic. Not better, you know what I'm saying, better able to fight your disease or live with it, I should say. –Mark

Coaching also helped participants seek the appropriate services in a timely manner, as Andy explains, "realizing I needed my eyes checked regularly as a diabetic and having him connect me to an optometrist was helpful because I may have waited too long and ran into other problems." For others, working with the diabetes coach gave them access to information that they may have otherwise not been aware of such as alternative medications on the market:

He was telling me about other medications out there that might be able to help me with my numbers so that when I went to the doctor's, I was more informed in that sense. So I was informed enough to ask certain specific questions. – Elaine

Overall, participants identified that regardless of how long they were diagnosed with T2DM, they found that diabetes coaching was informative and provided them with new insights to better their ability to adapt to life with T2DM.

Lastly, adapting to life with diabetes meant that some participants needed to understand the trajectory of their illness and what medications were required. Some participants described that diabetes coaching facilitated their transition to being on insulin. These participants initially hoped to manage their T2DM with lifestyle changes alone: "when I was first diagnosed, I thought oh you know, with lifestyle changes, maybe I'll be able to reduce or go off the meds" (Elaine). Participants reportedly refused to go on insulin earlier when recommended by other healthcare providers and felt, "really frightened…they want me to do this till I die and I'm not going to do it" (Jess). Prior to diabetes coaching, the transition to being on insulin was heavily perceived as a sign of "failure" (Mark) and "last resort as their health [had] declined too much" (Elaine). Furthermore, insulin was viewed as something harder to navigate in public situations: "it's difficult to take out all the extra stuff and people get scared watching you so sometimes, I just wouldn't" (Elaine). Lauren shared that her fear around initiating insulin had stemmed from both a phobia of needles as well as her familial history with it:

I know for my dad, once he started on insulin things just got worse. He started having more pain you know…pain in his hands and then he couldn't use them well... also think that the night he died, he had taken too much insulin too. – Lauren

It was apparent that for many participants, the main goal after being diagnosed with T2DM remained being able to effectively self-manage the illness without becoming dependent on long-term medications mainly, insulin. These findings captured a common

view amongst participants that insulin meant their diabetes had worsened and they were not managing it well. These views were shaped not only by their understanding of diabetes before coaching, and the use of insulin, but also historical experiences of others around them.

Participants who were being transitioned to insulin found that diabetes coaching offered them the knowledge and support they required. While some participants previously received insulin administration education and training from community health centres and their family physician, they found that the diabetes coach supplemented this learning. This allowed them to address some of their remaining misconceptions and fears around the use of insulin. This instructional support became particularly beneficial for those who were newly transitioning to insulin:

I was in the dark, totally. I knew only one thing that my pancreas…that it was not functioning and not secreting insulin so I have to take the insulin myself, and this is all I had in my knowledge. The coaching helped me with the insulin amounts I required, and how to inject and when to inject and how to respond to hypoglycemic position situations…I was more relaxed about what I was doing when coach was with me. –Nate

In addition to learning about the use and administration of insulin, participants seemed to understand that the "body naturally produces insulin" (Mark) and is "more natural than oral drugs" (Elaine). Participants learned that insulin was a healthy and essential treatment for managing their diabetes and became empowered in viewing it as "another tool in [their] toolbox to help [them] control [their] disease better" (Mark). Diabetes coaching seemed to facilitate participants' comfort level with insulin use.

In summary, diabetes coaching was able to offer some level of support to participants in their individual adaptation process, regardless of when the participant was diagnosed. The diagnosis initially came with a negative future outlook, which diabetes coaching was able to help improve. Participants gained new knowledge of T2DM and could apply this knowledge to better their self-management. Moreover, participants who were using insulin found that working with the diabetes coach helped facilitate this transition. As a result, diabetes coaching was able to foster a sense of empowerment and renewed control amongst participants, allowing them to better adapt to life with T2DM.

Theme 2: Heightened mindfulness of diabetes-related wellness

In addition to gaining more knowledge and a better understanding of T2DM, participants became more mindful about their diabetes-related wellness while receiving diabetes coaching. This heightened mindfulness meant participants used their increased awareness of diabetes-related wellness to engage in ongoing reflection of their self-management behaviours. However, the degree to which this heightened mindfulness was sustained and prompted behaviour changes varied amongst participants. Mindfulness has been defined as self-regulating one's attention to focus on the mental events of a present moment and subsequently, orienting to the moment with a sense of curiosity, openness, and acceptance (Bishop et al., 2006). Mindfulness for the present study is conceptualized as the practice of focusing attention on present changes in emotions, thoughts, and sensations with non-judgment, acceptance, and willingness to understand (Bishop et al., 2006). In doing so, one can better monitor their behaviours to achieve their diabetes-related wellness goals.

Participants felt managing T2DM daily along with other life stressors, such as life events, trips, employment changes, and other chronic illnesses to be challenging. They emphasized how managing their diabetes was often exhausting and frustrating since it required constant attention: "every minute and every hour and every day and every night fight…is not easy but you're diabetic and you don't have any choice" (Nate). Through diabetes coaching, participants understood that managing their diabetes was a routine practice that needed to be maintained amid other life circumstances:

That's what I ended up realizing while working with [coach]. That's the thing to keep it a routine no matter what's going on. There's always things in life that come up you know, marriages, deaths whatever, so your normal routine gets interrupted but your diabetes regimen can't really change that much; it's not that flexible. –Mark

Participants found that having regular check-ins and discussions with the coach kept their diabetes "fresh in [their] mind as something [they had] to be watching at all times" (Andy) and "right in the forefront so that [they knew], it was always there" (Anne) requiring them to pay attention. Participants described that this heightened awareness was inclusive of various aspects of their overall diabetes-related wellness:

I was more aware of the movement, the physical, the food and everything. I started paying attention to the medications and their effects on me and how and when I was eating and not just the numbers alone. So I was just more aware all around. –Bonnie

The diabetes coach prompted participants to address other aspects of their diabetes-related wellness; for example, to "get [their] eyes checked again or getting [their] feet checked out" (Andy) and "to follow up with the doctor regarding insulin changes" (Nate). The coaching experience encouraged participants to be aware of their diabetes-related wellness from a holistic lens. From this perspective, participants recognized how managing their diabetes was integrated with managing other aspects of

their health: "Why would I be caring about my diabetes if I wasn't going to care about my heart or other health areas…might as well, look after it all at the same time" (Mark).

Additionally, diabetes coaching engaged participants in the consistent reflection of their self-management behaviours. Through routine dialogue with the coach, participants were required to set small weekly goals and monitor their progress. For many, the check-ins served as a designated "period of reflection*"* (Jess) to assess their self-management behaviours: "used to force me to think about it, how did I do this week? What were the high points? What were the low points?" (Jess). These types of practices allowed participants to bring awareness to times they were not managing as well:

Because there are always new things that come up…and too, you can get lazy as with anything and sometimes, frustrated or things happen and life gets busy and you think, oh wow, did I really pay attention to my food? Or why did my sugars look so bad this week? –Elaine

Participants also reflected on how their diabetes-related wellness interacted with their emotional wellness:

I realized that part of controlling my diabetes is to become very aware of what's happening in my body and what I'm doing moment to moment. Earlier you see, everything used to be a blur. I used to be so emotional with everything happening around me and I had recently gotten divorced and I used to just eat and then I would get upset because my sugars were high and then I would resort to more eating. I never used to take the time to think about the whole cycle of it all that I was stuck in…with the coaching, I have been able to tie the eating habits to how I'm feeling more. –Jess

In the above quotation, Jess explained how coaching prompted her to pay attention to her emotions surrounding food and eating behaviours. Similarly, Rose described her relationship with emotional eating patterns, "…things become overwhelming and I find comfort in snacking which I have become aware of in all this." She explained how her attention to this behaviour was improved during coaching:

I had known it before but now I see it is constant…when I'm eating when I shouldn't be and there is a thought there somewhere that you know, you shouldn't be doing that. –Rose

Identifying these influences enabled participants to acknowledge and be "aware of the changes that [they] needed to make" (Nate) and gave them a chance to "come to terms with how I was really doing which was not well" (Rose). Coaching highlighted how managing diabetes was not exclusive to managing one's physical health, but also addressing mental health concerns and exploring avenues to manage them:

I went from pretty much hitting a target number for the first time and than 3 months later, going up to a number that's even higher than I was at for almost 2 years, when I was initially diagnosed. I had been managing my diet and exercising very well. So, then [coach] and I worked out little goals to try yoga, doing yoga, doing some meditation, essentially balancing more and seeing if reducing the stress level can change the numbers. –Elaine

However, heightened mindfulness did not always translate to behaviour changes, which will be further explored in the subsequent theme. Some participants described that they became more aware and began "watching what [they] were doing" (Andy) and receiving the check-ins helped them stay on track when making choices outside of calls with the coach. Andy incorporated the use of a daily log to track his behaviours during coaching, which he had never done before:

I had daily logs. I would do my blood sugar level first thing when I got up then, I would literally list my food intake for the day working out the calories and carbohydrates for everything I ate. I would even write comments below about my exercise and sleep patterns this and that. I was just generally aware of everything I was doing health wise. –Andy

Similarly, Martha discusses how she became more aware of the choices that she was making:

I maintained more of an awareness of making sure I know what I'm doing and making sure I'm eating right and picking out the healthier options, you know, doing all the things you're supposed to be doing as a diabetic. –Martha

In contrast, others described that despite becoming more conscious of what diabetes-related wellness entailed, they were not consistently mindful of their self-management. While it became a priority for some, it also remained something of concern periodically for others:

It was important to think about and work on when I could do it but if I was somewhere that I couldn't eat well or I didn't feel like than I didn't worry about it…it slipped my mind often between those calls. –Lauren

The diabetes coaching experience provided perspectives and practices that fostered participants' mindfulness of their diabetes-related wellness. While participants varied in how mindful they were of their diabetes-related wellness, many participants adopted ongoing reflection of their self-management behaviours during the coaching experience. While working with the diabetes coach, participants accepted that management of their T2DM can integrate into their daily lives and how a holistic approach to health can facilitate this process. Some participants also began reflecting on changes in their emotional wellness and how that related to their self-management behaviours. Overall, during the coaching process, participants gave attention to understanding patterns around their self-management behaviours and possible areas for improvement.

Theme 3: Behaviour change guided by participants

While the diabetes coach worked with all participants to develop and meet small goals aimed at larger health behaviour changes, the impact of this approach varied

between participants. The use of the diabetes coach to improve their self-management behaviours depended on certain participant characteristics and contextual factors: a) their source of motivation, b) time from their diagnosis and c) the presence of other external life stressors.

All participants were required to develop and work towards meeting small weekly goals to improve their diabetes self-management. However, there were differences in the participants' source of motivation for change. Some participants described themselves as extrinsically motivated and the other subset, intrinsically motivated. Ultimately, these differences influenced whether behaviour changes were sustained long-term.

A majority of participants reported an increased sense of accountability for their self-management behaviours when describing their relationship with the coach. For these participants, the diabetes coach acted as an extrinsic source of motivation in reaching their self-management goals. Participants who were extrinsically motivated felt they worked better to "stay on track with things" when "accountable to somebody else besides [themselves]" (Martha). For instance, participants perceived weekly check-ins with the coach as a way to hold them accountable. The relationship with the coach built a "sense of responsibility for [their actions]" (Elaine) amongst participants. Many described that they didn't want to disappoint the coach, which became the driver for meeting their own goals:

I like to be an honest person so if he were to phone me and say, "Did you do your 10 000 steps everyday?" I would have a hard time…I don't want to be a failure so of course I would push myself to make sure I got those in everyday so that I could tell him, "Yes, I met that goal." –Carrie

Participants in this group described that despite having the knowledge and awareness of self-management practices and the importance of maintaining them, they were not motivated to engage with them on their own:

It was good in a sense that it made me accountable. It was nice to have that phone call so that I was motivated in the right way because if I didn't, a week or two would go by or three weeks and I would say, "I'm going to do this!" but I wouldn't get around to it. But yeah, knowing that I have that phone call coming would push me a little bit more. – Elaine

One participant wanted much more direction from the coach in terms of setting her own goals: "well, you tell me, what should I be working on? Like, what should I be doing? What changes should I be making?" (Carrie). Carrie's experience with diabetes before coming into coaching had been well managed and as a result, she was unsure of how to use the coach. A few participants appreciated receiving close monitoring from the coach "keeping tabs on [them]" (Ray, Bonnie) and felt they benefited from "having somebody babysit [them], somebody who [was] right beside [them], watching [them] and making [them] be accountable" (Bonnie). For such participants, behaviour changes made through increased accountability was sustained during the coaching experience with ongoing positive reinforcement:

Like right before that meeting, I think oh, I better get on track here and do what I'm supposed to do and you know that carried over for the week after because you've had that meeting and that encouragement...you keep wanting to meet your targets and report good things. –Martha

However, many participants who depended on the coach for motivation were unable to sustain these self-management practices beyond the coaching experience. When the coach was removed as a source of extrinsic motivation, participants found themselves, "going back downhill again" (Bonnie) and "not able to maintain any type of change"

(Rose). Following coaching, some participants failed to maintain the behaviour changes made during the coaching experience:

It seemed to be more helpful when I had you know, a coach once a week, checking in…when coach called. I kept track of the numbers more consistent and now, I don't. You know, if I miss, I miss. If I don't do it that day then whatever…I don't mark anything down. It's kind of like oh well, I missed it so tomorrow…and then you can miss it tomorrow and it goes on like that… I don't have to answer to anybody. –Ray

Furthermore, these participants struggled to self-manage independently and troubleshoot when challenges arose after their coaching experience ended:

This really isn't a big excuse because I haven't had [coach] for months now but umm…when I started to get sick, I didn't know whether I should be taking my insulin or not. –Bonnie

Conversely, a smaller subset of participants described a contrasting experience of working with the diabetes coach where they held themselves accountable for their self-management behaviours. These participants used diabetes coaching differently from those described above and remained more independent of the coach. Participants within this subgroup felt they received diabetes coaching at a time when they were ready to implement changes in their self-management:

To tell you frankly, I didn't find anything least beneficial. I think [CHC] reached out to me with [coaching] at the right time when I was so low. I was miserable and I was frightened and I didn't know what to do because I felt like the health system was not giving me the support that I really needed…I knew I was in a bad place with how I was handling my diabetes and I was looking for direction. –Jess

While they also described coaching as a positive and encouraging experience, the motivation for the change was intrinsically driven. Participants discussed being self-motivated and showed initiative on their own with less direction from the coach. One

participant below explains how he took it upon himself to develop his self-monitoring behaviours:

I didn't really utilize him as much as maybe, some people would because even if you checked with [coach], he could tell you that I was a fairly organized fella. I created my own spreadsheets for tracking my meals, what I was eating, what my numbers were for different times of the day and everything else I thought was needed. –Andy

Further, these participants took advantage of the variety of services through their CHC, as advised by the coach, and connected to others for additional support:

This disease…if you go to a place like [CHC], you will have support groups and it's a way to get out the house. Even…they have a track there and you could walk you know, inside track or what not. It's just a gathering place of diabetic people and you can swap ideas, swap recipes, whatever you want to do. You never feel alone…It keeps you going. Everyone there is dealing with the same thing so I utilized that a lot. –Mark

Participants who showed greater intrinsic motivation for their self-management behaviours wanted to "take control of [their lives] and not…depend on doctors" (Jess) and sought their preferred services such as a "naturopath" (Jess) and "personal development group" (Jess). These participants began diabetes coaching with an established internal desire to make changes in their self-management. However, the support received from the diabetes coach was still perceived as helpful and propelled them further in their behaviour changes:

You know what, I likely wouldn't have gone to the extent of it that I did until I talked to him. I likely would've started keeping track of my steps. I would've likely kept track of what I was eating more or less but I likely wouldn't have been as diligent about it. –Andy

Participants who demonstrated an intrinsic source of motivation sustained the self-management behaviour changes after the diabetes coaching experience. These participants felt they were now "on the right track [themselves]" (Jess), "on [their] way

up" (Jess), and were now "confident in [their] own ability to handle different diabetic scenarios" (Mark). Participants felt they gained autonomy with their self-management and would not benefit from receiving any further coaching at that particular time, but would be open to check-in in the future:

I don't believe I would require it in the future but yeah maybe, a refresher, a month long sort of refresher after 4 or 5 years …something to kind of enforce it again but it's not something. –Andy

In contrast, many participants who had shown extrinsic motivation reported a need for prolonged coaching and suggested that there should be weaning from the process:

Not to be dropped so fast when the coaching is over. So let's say…I know that you can't do this forever, babysit somebody forever but let's say it's for 8 weeks but then the diabetic coach also calls you in 10 weeks or in 14 weeks you know, for maybe, the next 6 months at least…still sort of checks up on you. –Bonnie

These findings suggest that the appropriate frequency and duration of contact with the coach will vary amongst participants. Also, four participants suggested the use of a "group" (Andy, Carrie, Martha and Nate) approach to coaching, which could potentially "provide a motivating atmosphere for people who do well in that sort of thing…" (Andy), and offer "ongoing support" (Martha), and "…make things a lot better than if someone were fighting individually" (Nate).

Overall, findings suggest that participants fell into two separate groups: being accountable to the coach or themselves as motivation for behaviour change. Those that were accountable to the coach and extrinsically motivated showed some dependency after coaching. The duration of coaching provided was not suitable for these participants' needs. On the other hand, participants who were more accountable to themselves and intrinsically motivated achieved a sustainable and greater level of independence related to

self-management. Ultimately, the participants' source of motivation influenced the achievement and sustainability of participant behaviour changes.

Another participant characteristic related to how diabetes coaching was used was the time since their diagnosis. Almost all participants shared that diabetes coaching was or would be most beneficial for newly diagnosed individuals. Participants explained that there might be a window of opportunity with individuals newly diagnosed with T2DM who are struggling to self-manage well could benefit from the coach as "somebody to give them that little push or little guidance right away and they'll be on their way…on the right track" (Mark). Further, diabetes coaching is focused on fostering independence by setting small weekly goals and building on self-management skills. A newly diagnosed individual has the opportunity to gradually build these skills. Participants generally used the coach for support and "good soundboard" (Andy) to evaluate their ideas and approaches to management:

Coach was always good at putting the ball in my court and asking me, "what do you think about this or what is your answer on this?" He made me make my own decisions but with his guidance, let's say. He was good at kind of making me independent but it was nice that…I didn't ever feel like I'm on my own asking this by myself. I could make some notes and say, oh, I'll ask coach next week and discuss it then. –Bonnie

Participants also highlighted that being able to "focus on one thing that [they] said they would do" (Elaine) provided them with a chance to build on their self-management skills gradually. The approaches to diabetes coaching would be particularly helpful for newly diagnosed individuals who are building their knowledge and confidence to self-manage. Overall, most participants felt that receiving diabetes coaching earlier in their journey would be more beneficial in terms of instilling strong self-management skills sooner.

Finally, the adoption and sustainability of behaviour changes were influenced by external factors in an individual's life. Some participants reported that given barriers, such as financial concerns, they were unable to access the necessary equipment to meet their self-management goals:

One thing that irks me about the meters is that your test strips are covered, your meter is covered but your needles to inject yourself with insulin, you have to buy those. They are not covered by the government. Now that doesn't make a whole lot of sense because without the needles, how can you give yourself the insulin and that should be covered. I'm on a fixed income and don't have a lot for pensions…so I'm getting less than 1300 a month….I can't take the vial of insulin and swallow it so what's the point of checking. –Ray

For others, the presence of other coinciding health concerns impeded their ability to focus on improving their diabetes self-management, even during the diabetes coaching experience. One participant provided insight into the challenges of implementing any behaviour changes while concurrently battling depression. She voiced that she was "not able to maintain any type of change" (Rose). The interview highlighted her sense of defeat throughout the coaching experience:

I just don't have the staying power anymore…you know, the willpower. Like I can look ahead and yeah, I'd like to weigh this much or I'd like to look like this or be able to fit into that so I can have an end goal but I can't get there. I can't get past all of these other things and I mean, at this point, I've probably given up because it's almost like it's insurmountable you know, what I would have to do. –Rose

Both the aforementioned participants struggled to keep up with their own goals due to external stressors but utilized the coach for psychological and educational support.

In summary, participant characteristics and context can influence their readiness to adopt and sustain self-management behaviour changes. Having an extrinsic source of motivation can impact dependency and eventually, sustainable behaviour changes. The

drive to make such behaviour changes ultimately depended on the participant and determined their overall experience:

Yes, it's still nice to have a coach there to talk to for the other things like to get information or for moral support kind of thing but…if you're not putting in the effort than you're almost wasting your own time. [Coach] can always tell you something but if you're not willing to try what they suggest then how can you give feedback to say, "yes, this is working well and this is not." –Elaine

Diabetes coaching may be particularly useful for those who are newly diagnosed as a way to provide guidance and build autonomy by having regular discussions and opportunities to strategize with the coach. Finally, external stressors, such as financial or other health concerns, present in participants' lives impacted their ability to meaningfully engage in diabetes coaching.

Theme 4: Valuing a supportive relationship

Participants perceived diabetes coaching as an opportunity to develop a uniquely supportive relationship with the coach. Participants felt that the support from the coach was distinct from other healthcare providers or those in their personal lives, which was something they needed. The relationship with the coach was valued for being reliable, holistic, non-judgmental, and encouraging. These qualities were salient in participants' descriptions when recounting their relationship with the coach and will be explored in detail below. Regardless of the outcome with diabetes coaching, all participants shared that they felt a strong level of appreciation for the support they had received.

The weekly interactions with the coach were valuable to participants who describe that they anticipated and prepared for their weekly calls:

You knew that you were just going to get that phone call and I had my questions in my head. Like you know, I put down in my booklet what time and date [coach] was going

to call and then, whenever I had questions or ideas or whatever, I put them right beside that time. –Bonnie

Participants identified that there was a need for additional support, outside of their standard check-ins with their primary care physician, to address many other self-management concerns: "our doctors are very busy and we have a shortage and they don't have time to sit with you all the time and calculate your insulin or answer all your questions" (Nate). Participants were reassured that they could rely on the coach in the interim: "you knew that [coach] was going to call at a certain time and so, someone was going to touch base with you which is helpful when you're figuring things out" (Martha). The coach was dependable support that "never missed a phone call" (Carrie) and "always got back to [them]" (Anne, Andy). In doing so, they felt the coach was able to adequately capture their progress over a longer period as "many things can happen in 3 months" (Jess). This progress tracking was more beneficial for those who did utilize CHC services and had their work with the coach directly transferred to their primary care provider:

Right cause if you go like once every three months, then you're more likely to say how you feel that day and not really how it was over the last three months. Where if I talk to [coach] once every week for the three months, he has a little bit to say about each one of those times and they can read it. Before I even get into the office, she's already talking to me about what's transpired. So, I found that I was able to give my doctor more knowledge and I don't know if all the coaches have that but I know [CHC] is like that. –Mark

Having access to a reliable form of support between regular primary care follow-ups provided the continuity in care that participants desired.

Secondly, participants described that the coach took a holistic approach to their health. This was different from their usual experience in which they described "some doctors, you're only allowed to talk about two things and you got 15 minutes so you got

to get it out and carry on" (Mark). Participants described that their primary care physicians often sought to provide "bandaid solutions" (Jess) by adjusting their medications or offering small strategies.

The coach has a keen interest in their health overall by asking about and addressing other stressors or coinciding health challenges: "I got to talk about the stress I was feeling with work and managing this and we figured out how I could change my medication times and I started looking into yoga after that" (Elaine). They found that coaching was more holistic and recognized aspects of their lives that influenced their diabetes. For many, the coach was "interested in hearing how [their] week went" (Rose), "interested in [their] story and [their] situation" (Mark) and they didn't feel as though, they were just "another patient, let's get it over with" (Ray). Although the allotted times for calls was set to 15 minutes, participants never felt "confined to it" (Carrie) in their interactions. They described that the coach took the time to actively listen, ask questions, and never made them feel rushed allowing for wholesome discussions to take place:

He took his time and I felt he cared to really know how my day went. I would say, "Well I went to try this class." He would ask, "Well, how did you find it? Did you enjoy it? Was your husband able to go with you?" Not just okay well, that's good and I'll call you next week. He was never in a hurry and really seemed to want to understand the goings on. –Anne

For others who were extrinsically motivated, the coach's interest and approach helped engage them in making health behaviour changes: "my original doctor, he retired and didn't inform me a great deal…he just wasn't excited about it and it was just like everything so I wasn't too concerned about it until later when I got into this program" (Ray).

Furthermore, participants also identified that "the ability to listen and not be judgmental" (Andy) was one of the most valuable qualities of a good coach. Many participants described that they had previously faced judgment from people in their personal lives and other healthcare providers when failing to meet adequate self-management behaviours. As such, this created a barrier when it came to accessing other providers: "you don't feel like going to see the doctor because you know you haven't been doing what you were supposed to…you don't get to explain everything that's going on and you know they're disappointed" (Lauren). The judgment imposed by others made it particularly difficult for one participant who was concurrently battling depression:

I mean I guess…well, you know, all the other people whether it's family or physicians or whatever…there was no…I guess, they were getting past the point of being sympathetic maybe, because I have been diabetic for so long. –Rose

A few participants acknowledged that they had often engaged in emotional eating habits when trying to manage and maintain their weight and healthy diets. This was often met with unsolicited "criticism" (Martha) and a lack of support from family and friends:

You do need that emotional support and you do need somebody to cheer you on instead of saying, "don't do this and don't do that" because that's what family and friends start saying. "Oh, we heard you shouldn't eat this." "Don't eat this" and "why are you eating this?" Because sometimes when you're stressed, you eat. –Jess

Alternatively, they found the coach to be someone who "was never judgmental" (Jess) and "didn't chastise [them] for not being able to do what [they] said out to do" (Rose). Most participants voiced that even while aiming to self-manage better, there were periods of "transgression" (Andy), and "temptations do come up every single day" (Martha) which were inevitable. As such, participants described that the non-judgmental relationship allowed them to be transparent about their choices:

[Coach] doesn't make you feel bad and I think people need that for this sort of thing. I could say I had a beer to two and while he would explain why that wasn't the best choice, he could laugh about it and you need that with you cause it happens…I think having a little compassion is likely part of it. –Andy

Participants explained how the coach "never said 'you're wrong' or 'why would you do that' but guided me to see if I was right or if I would realize the effects myself" (Bonnie). Regardless of their outcome, participants felt that the non-judgmental approach was helpful:

Whether it's his personality or just the way he approached it…you know, I tried to tell him what I was feeling or what was going on and he never made me feel bad about what I did or didn't do. So, you know, like I said, the end result is not an improvement but going through it, it was just helpful to get that call every week. –Rose

Furthermore, the language used by participants in the quotations above such as "chastise" (Jess) and "transgression" (Andy) illustrates their experience with diabetes. Participants have felt judged or stigmatized by other healthcare providers in the past and feel a sense of guilt around any decisions viewed as unhealthy. Conversely, the non-judgmental, open dialogues they had with the coach built their comfort and ability with discussing their diagnosis and its associated challenges, which carried over to other relationships and external supports:

A lot of people my age when they first become diabetic, they are maybe not as knowledgeable or they feel there is a stigmatism attached to being diabetic and don't really want that or to be open with it right. That's the way I kind of was; I just kept it to myself. I didn't want people to know and yet, that was probably the worst thing to do. Then when I went to [CHC] and started talking to [coach], I felt like you know what, there's nothing wrong with me. I have this disease and I need the help and support and there are others in the same boat. So as it went on, I felt more comfortable as a diabetic having the coach, that's for sure. –Mark

Participants valued that their check-ins with the coach remained positive regardless of whether they were able to reach their bigger goals, only attain smaller goals,

or unable to make any progress at the time. The coach consistently encouraged them and found ways to reassure participants even if they felt they were not doing well. This characteristic of the relationship was crucial for recipients of coaching when they felt they were not seeing the results they had anticipated:

Also the support that I got from just the reassurance of him saying, you know, "you're doing great" kind of thing, "don't be so hard on yourself" and explaining why maybe someone else can control their numbers better even though they're on lesser medications. Doing little things like that just gave me a little bit of reassurance and it settled things for me. –Elaine

This encouragement was particularly important for participants who used the coach as an extrinsic motivator:

He's always encouraging and when you get a lot of encouragement for something, it's easier to continue doing it. Always encouraging, always giving you a step forward, giving you positive feedback even when you're thinking that you didn't do so well. He could pick out like, "but, you're doing this well, you did this." –Martha

Participants found their relationship with the coach to be uniquely supportive and distinct from those with family and friends since the coach understood their experience:

Family, they can support you but they don't understand. They don't understand some of your fears or frustrations and having that person on a regular basis to share those frustrations and having then with the experience and knowledge that they know to help you get through that, yeah, it just puts you in a better place kind of thing and motivates you. –Elaine

Those who had fewer supports at home and were struggling to find guidance found that they "didn't feel as alone" (Bonnie) when working with the coach and heavily relied on this support. Participants used the coach for support in various ways. While for some, the coach worked to provide support only with diabetes; others had extended this relationship to more personal discussions where the coach became more of a "life coach" (Mark). One participant who identified having depression used the diabetes coaching for psychological

support and continued past the allotted time as the coach agreed to, "carry on for a little bit and tried to call [her] every two weeks just to see how [she's] doing" (Rose). The bounds of the coach-participant relationship were determined by what the participant was willing to share with the coach and ultimately guided the support they received:

If I was over-worked or had to do something and felt overwhelmed, I would say, "you know, I was feeling overwhelmed." I didn't really share too much of what was happening in my life. We stuck to the diabetes and the diet part of it…it never occurred to me because having lived alone for nearly 40 years now, I am so used to coping with things myself. I think it was the health part of it that I was happy to share with him. –Jess

Participants found that the delivery of diabetes coaching via telephone was "convenient" (Anne, Ray, Andy, Jess) and provided them with "flexibility during the week" (Andy, Elaine). However, some participants stated that they still would have liked a "face-to-face" (Rose, Elaine) interaction with the coach, whether initially or throughout the experience. Participants developed a bond and felt that it would have been "nice to put a face to the voice" (Elaine) or to receive a video call:

I would've liked a video call…more personal. I could show my blood sugars or whatever, my medicines. And if a person is looking at you and you know them…he could say to me, "You're not looking very good today Mark, what's wrong with you? –Mark

Overall, participants viewed their relationships with the coach as offering a unique form of support and valued them for being reliable, holistic, non-judgmental, and encouraging. Coach-participant relationships were regarded as "genuine" (Mark, Ray, Elaine) connections. While the reliable and encouraging approach was appreciated by participants, for some, this approach provided an extrinsic source of motivation that may have fostered some dependency. Nonetheless, during the coaching experience,

participants felt comfortable and validated through the coach's inquisitive and understanding nature.

Summary of Findings

- Four main overarching themes were generated from a total of 12 participant interviews; two of the main themes have subthemes.
- *Adapting to life with T2DM* highlights the process many participants undergo from becoming diagnosed with T2DM, understanding, and accepting their diagnosis as a chronic condition, and making the necessary changes to live with it. Diabetes coaching assisted with this process by addressing misconceptions, reframing the initial outlooks on quality of life, providing increased knowledge and awareness, and facilitating the transition to long-term medications such as insulin.
- *Heightened mindfulness of diabetes-related wellness* captures the increased attention participants' gave to their health and self-management behaviours. Mindful eating was a prominent example of participants' engaging in reflection and exploring their habits more thoroughly. Increased mindfulness did not translate to behaviour changes and was not sustained between interactions with the coach for all participants.
- *Behaviour change guided by the participants* highlighted the differences in participants' readiness to make self-management behaviour changes and overall, utilization of the coach. Two distinct groups were identified: those who used the coach as an extrinsic motivator and those who had developed intrinsic motivation.

Those with intrinsic motivation to make changes were able to maintain self-management behaviour changes past their coaching period. The ability to make behaviour changes was further influenced by years since being diagnosed and other external stressors.

- *Valuing a supportive relationship* illustrates the unique coach-client relationship that participants describe from their experience. Participants valued the relationship for being reliable, holistic, non-judgmental, and encouraging. Further, participants' experiences with previous healthcare providers and friends/family highlight the stigmatization that remains around T2DM.

Chapter Five

Discussion

This qualitative study examines the experience of adults with T2DM who have received an evidence-based diabetes coaching intervention within the Canadian context. While the study aimed to explore the experience of receiving diabetes coaching, participants' experiences with receiving the diagnosis and self-managing T2DM alongside other life experiences were also explored. In doing so, contextual details around the participants and their journeys with T2DM are also captured in the findings described in the previous chapter. Four main overarching themes were identified: i) *adapting to life with type 2 diabetes,* ii) *heightened mindfulness of diabetes-related wellness,* iii) *behaviour change guided by the participant*, and iv) *valuing a supportive relationship*. The following discussion chapter will examine these study findings against the background literature, additional relevant supporting literature around T2DM, and the relevance of the theory of planned behaviour, which was used to inform the study.

Psychosocial Impact of Living with Type 2 Diabetes Mellitus

The themes *adapting to life with T2DM* and *valuing a supportive relationship* illustrate that participants extensively used coaching for psychosocial support. This suggests that psychosocial support may be a valuable component of the diabetes health coaching model amongst participants. The diabetes coach offered psychosocial support in addressing the stigma around T2DM, psychological insulin resistance, and the presence of diabetes-related distress and/or depression.

Stigmatization of people living with Type 2 Diabetes Mellitus

Health-related stigma refers to adverse social judgments imposed on a particular group of individuals due to a shared health condition or problem and may be enacted through negative stereotypes, blame, labeling, exclusion, and discrimination (Kato et al., 2016; Weiss et al., 2006). Schabert et al. (2013) conducted a review of social stigma in the context of T2DM and found that HCPs and other individuals who were not diagnosed with T2DM did not perceive it to be a stigmatized condition. However, individuals living with T2DM reported experiencing significant stigma surrounding the condition with negative effects on their self-care practices, psychological wellbeing, and overall clinical outcomes (Schabert et al., 2013). The findings of the present study further support existing literature around the stigmatization surrounding T2DM and highlight the role that the diabetes coach can play in helping individuals living with T2DM to address it.

The first theme, *adapting to life with T2DM* highlights the various experiences encountered by participants in coming to understand and accept the diagnosis as a chronic condition. These experiences included participants' feelings of shame and responsibility for receiving the diagnosis as well as, feeling differentiated for enacting self-management behaviours. The findings of this study are consistent with those reported by Browne et al. (2013), who conducted a qualitative exploration of the perceptions and experiences of diabetes-related stigma amongst adults living with T2DM in Australia. Browne et al. (2013) found that individuals with T2DM face various stigmatizing attitudes and practices as part of the social experience of living with the diagnosis. This diabetes-related stigma is experienced at personal and societal levels from other healthcare

providers, family and friends, and the media (Browne et al., 2013). These include feelings of blame and judgment from others for having caused the diagnosis, experiencing negative stereotypes such as being lazy or obese, feeling discriminated and losing opportunities for lifestyle restrictions (Browne et al., 2013). Since T2DM is a condition that is heavily influenced by lifestyle choices, many individuals with the diagnosis come to internalize the negative stereotypes around the condition (Kato et al., 2016; Schabert et al., 2013). This often results in feelings of self-blame, shame, embarrassment, decreased self-worth, and social disengagement (Browne et al., 2013; Schabert et al., 2013). Likewise, participants of the present study described feeling responsible for the diagnosis and consequently, ashamed. Those with a familial history of T2DM also bore this sense of responsibility. Participants described viewing the diagnosis as a "dirty little secret" and concealing it from friends and family thereby, straining and reducing their available social supports. Browne et al. (2013) also identified that the stigmas around T2DM posed a barrier, as participants were ashamed of disclosing their diagnosis to attain appropriate supports thereby, enduring psychological distress. Not wanting to face the stigmatization imposed by society, clarify misconceptions about T2DM held by those around them, or having to worry individuals around them were some common reasons for nondisclosure (Browne et al., 2013). In the present study, participants described that coaching further made them more comfortable with openly discussing their diagnosis with family and friends thereby, increasing their available supports. However, Browne et al. (2013) found that older participants were more likely to openly discuss their diagnosis and welcomed the opportunity to share their experiences. They suggested that older individuals with

T2DM were more likely to have peers diagnosed with the same condition and therefore, able to find support networks and encounter less stigma (Browne et al., 2013).

In the current study, participants further voiced discomfort around making certain dietary selections and using medications or completing blood glucose checks to manage their diabetes at social gatherings. These self-management behaviours are salient attributes that differentiate those with T2DM, allowing for them to be associated with negative stereotypes (Schabert et al., 2013). As a result, it is not uncommon for those diagnosed with T2DM to often engage in concealing these essential self-care behaviours and thus, compromising management regimens (Kato et al., 2016; Schabert et al., 2013).

Furthermore, in the theme *valuing a supportive relationship,* participants disclosed having felt judged when failing to manage well or adhere to treatment plans by their former healthcare providers. These findings are congruent with those reported by Browne et al. (2013) where participants shared similar experiences of stigmatizing practices and attitudes within the healthcare system. Participants felt that healthcare providers consistently focused on what they had been failing to do or targets they were failing to reach while neglecting to encourage positive behaviour changes (Browne et al., 2013). Consequently, participants perceived minor indulgences in treats and snacks as 'transgressions' in their behaviour and were hesitant to openly share their self-management activities due to a fear of negative appraisal. Such experiences often lead individuals with T2DM to change providers, seek other sources for advice, such as the Internet and friends, and avoid the care they need (Browne et al., 2013).

As illustrated, the findings of the present study further support the significant level of ongoing stigmatization that is faced by individuals with T2DM and the barrier it poses in allowing them to adapt to living with the diagnosis, manage it well, and access appropriate support and healthcare services. Fortunately, participants felt their experience with the diabetes coach offered support in addressing some of the stigmatization they had or were currently experiencing. Many participants indicated that they were more open and comfortable in their dialogues surrounding their diagnosis following coaching. They identified that the coach further served as a confidante who was able to recognize and listen to their experiences with stigmatization. It was important for participants to have the coach also highlight other factors impacting their blood glucose levels including stress, illness, medications, genetics, and other measures that were beyond their control. In contrast to their experiences with former healthcare providers, participants identified that the diabetes coach had been non-judgmental allowing them to have more open and transparent conversations around their diabetes management. As such, diabetes coaching may provide emotional support and therapeutic communication that research suggests may mitigate the impact of the existing stigmatization around T2DM (Schabert et al., 2013).

Overall, healthcare providers should take on an active role in creating a space for their clients with T2DM to discuss their experience with diabetes-related stigma in relation to their perception of the diagnosis, their sense of self, their relationships, and self-management behaviours. Healthcare providers need to be aware of their potential role in stigmatizing the diagnosis and focus on building relationships with their clients that do

not impart judgment on their ability to self-manage or follow treatment plans. Healthcare providers need to be aware that diabetes-related stigma is part of the social experience for those living with T2DM and assess for the impact it may have, not only their ability to manage their diabetes but also, their psychological well-being. The findings suggest that diabetes coaching may be able to offer support for individuals living with T2DM to address this unique concern.

Psychological Insulin Resistance

Psychological insulin resistance refers to the reluctance amongst patients and their healthcare providers to both initiate and continues with insulin therapy for the management of diabetes (Brod et al., 2009). Consequently, insulin has often been started as a last measure of therapy in diabetes management although, evidence suggests that earlier initiation promotes better glycemic control with fewer complications (Brod et al., 2009). Eight of the participants that were interviewed were previously using or introduced to insulin for their diabetes management. The interviews with these participants shed light on the reluctance, fear and misconceptions that many individuals with T2DM have when transitioning onto insulin for their management. Participants felt that being initiated on insulin meant deteriorating health and a failure to self-manage on their part. They feared social judgment from those around them for being placed on insulin and physically having to administer in public settings. Even participants who had been using insulin before diabetes coaching acknowledged that they did not have a complete understanding of the mechanism behind insulin, reasons for titrations of their insulin or how to manage insulin-induced complications.

The findings of the present study further support and resonate with the existing work on psychological insulin resistance to date. The review by Brod et al. (2009) found that patients often had a lack of knowledge about diabetes and the mechanism of insulin leading to misconceptions. Historically, providers have used insulin as a threat to encourage clients to make positive behaviour changes, and initiated insulin later in treatment regimens. As a result, patients have commonly associated insulin with severe complications such as cardiovascular events, blindness and amputations (Brod et al., 2009). Hypoglycemia, cardiovascular risk and weight gain are all possible side effects that raise additional concerns for patients. Similar to the findings of this study, patients view insulin as personal failure or punishment for poor self-management, and often experience feelings of self-blame and guilt (Brod et al., 2009). Physical concerns that hinder insulin use include unease about mastering the necessary skills for self-injection and needle phobia as observed in this study. Individuals with T2DM reportedly perceive increased demands, inconveniences and lifestyle restrictions with the use of insulin (Brod et al., 2009). Furthermore, in alignment with the stigma surrounding T2DM, patients also fear that public injecting may be negatively mistaken for intravenous drug use or serious illness. Primary care providers may further be less inclined to prescribe insulin due to their own discomfort with insulin treatment and its side effects, as well as concerns around a patient's ability to self-manage or keep up with treatment plans. The risk of hypoglycemia or poor follow-up pose additional barriers. Overall, psychological insulin resistance remains highly multifaceted and patients require thorough assessment and support to overcome these challenges (Brod et al., 2009).

Participants felt that diabetes coaching both provided them with more knowledge and awareness and addressed many of their concerns and misconceptions around using insulin to manage their diabetes. Through their discussions with the coach, participants were able to better understand how insulin can be appropriately used to manage their diabetes and avoid future complications. Participants were given the opportunity to openly discuss and address their own fears around insulin which made them feel more at ease and comfortable with its use. These findings suggest that diabetes coaching may be a suitable intervention to address psychological insulin resistance and should be further researched.

Diabetes-related distress & Depression with T2DM

Diabetes Canada identifies that a variety of diagnosable psychiatric disorders including major depressive, anxiety, and sleep disorders are more prevalent amongst those diagnosed with T2DM (Robinson et al., 2018). There remains a complex interplay of variables between diabetes and various psychiatric conditions that is not well understood. Symptoms from psychiatric disorders and the use of certain antipsychotic medications may pose a risk for developing T2DM. Alternatively, the psychological impact of T2DM may also lead to a greater risk for developing certain psychiatric disorders (Robinson et al., 2018).

Literature suggests that individuals living with T2DM experience an array of unique concerns such as adjusting to the diagnosis, psychological insulin resistance, fear of hypoglycemic episodes as discussed previously, but also diabetes-related distress (Robinson et al., 2018). Diabetes-related distress refers to the cumulative psychological

impact caused by the stress of maintaining self-care regimens, stress placed on social relationships and the patient-provider relationship, as well as, the emotional toll of living with the diagnosis (Robinson et al., 2018). The presence of underlying diabetes-related distress from maintaining self-management behaviours and living with the diagnosis is highlighted throughout the ideas described in themes *adapting to life with T2DM* and *valuing a supportive relationship.* Participants discussed their frustrations and exhaustion from staying on track with dietary choices, exercise, and appointments. They further described their negative outlooks on their expected quality of life, their reluctance to engage in social activities due to restrictions, and the stress of connecting with healthcare providers. On the other end of the spectrum of diabetes-related distress is depression, and two of the 12 participants interviewed reported having depression concurrently with T2DM and used diabetes coaching predominantly for psychosocial support.

Participants viewed the relations with the diabetes coach as distinct from that with former healthcare providers, and friends and family. Participants described that diabetes coaching allowed them to openly discuss and address these concerns specific to diabetes, which they could not do with others around them. Participants identified that connecting with the diabetes coach was a positive experience and offered support regardless of their outcomes with self-management goals. So much so that, one participant, suffering from concurrent depression, reported that they had continued to work with the diabetes coach past the study. This in turn raises concerns around the availability of continued psychological support after diabetic coaching is discontinued for like individuals.

External literature highlights the importance of the availability of the aforementioned psychological support contacts by demonstrating the significant prevalence of the overall impact of both diabetes-related distress and depression in those with T2DM. Perrin et al. (2017) conducted a systematic review of 55 studies of diabetic distress amongst adults with T2DM. Results of the review found an overall 36% prevalence for diabetes distress among individuals with T2DM, which was greater among females and those with comorbid depressive symptoms (Perrin et al., 2017). Individuals with increased levels of diabetes-related distress are found to have a higher mortality rate, greater risk of cardiovascular disease and poorer quality of life (Robinson et al., 2018). Diabetes distress is understood to be more widespread than depression in those with T2DM with a greater longitudinal impact on HbA1C (Perrin et al., 2017). Additionally, approximately 30% of individuals diagnosed with diabetes present with clinically relevant depressive symptoms while 40-60% of those with depression are at a higher risk for developing diabetes. Diabetes Canada identifies that a comorbidity of depression often results in decreased motivation in T2DM self-care regimens due to the accompanying apathy and leads to poorer clinical outcomes, increased risk for complications and healthcare costs (Robinson et al., 2018). This resonates with the findings of the present study where participants with coinciding depression displayed a sense of resignation towards developing and meeting their self-care goals. It was some of these very participants that extensively used diabetes coaching for psychological support.

In alignment with the recommendations of Diabetes Canada, the diabetes coach did offer participants with self-management strategies and education to assist them in

adapting to life with T2MD, addressing their diabetes-related distress and fears around hypoglycemia and insulin (Robinson et al., 2018). Furthermore, in the theme *mindfulness of diabetes-related wellness,* participants reported that the consistent check-ins, dialogue and reflections around their diabetes management allowed participants to become more mindful of their mental health in relation to their diabetes. Participants became aware of and acknowledged other emotional stressors that were impacting their decisions around physical health through the coaching process. The use of mindfulness techniques to reduce diabetes-related distress has been explored in the literature with conflicting results. In the DiaMind Trial, examining the use of a mindfulness-based intervention showed a reduction in emotional distress and an increase in health-related quality of life measures with no significant effect on HbA1C or diabetes distress (Van Son et al., 2013). However, the RCT included both type 1 and 2 diabetes and used the Problem Areas in Diabetes scale to measure diabetes distress. Alternatively, Friis et al. (2016) conducted an RCT examining the effect of a mindful-self compassion intervention focused on reducing harsh self-criticism behaviours among both type 1 and 2 diabetes. The study by Friis et al. (2016) found statistically significant reductions in depression, diabetes-related distress measured by the validated Diabetes Distress Scale, and HbA1C at three-month follow-ups. Even though encouraging mindfulness specifically was not embedded in the training of the diabetes coach for the present study, it requires validation in future studies.

Thus, it appears that for participants with signs of severe depression, collaborative efforts with other providers specialized in mental health services for ongoing support is warranted. Based on the findings, it is recommended that diabetes coaches play an active

role in screening for depression and other psychiatric conditions in order to refer them to appropriate mental health supports (Robinson et al., 2018). The Diabetes Distress Scale is a validated scale of 17 comprehensive measures that is specifically designed for individuals with T2DM and is an example of a screening tool that may aid diabetes coaches in their efforts to better understand how to manage a particular client (Perrin et al., 2017; Robinson et al., 2018). Furthermore, equipping diabetes coaches with training in cognitive behaviour therapy, stress management and training in coping strategies may supplement their role (Robinson et al., 2018).

Diabetes Health Coaching and Behaviour Change

One of the primary aims of diabetes coaching as a self-management support is to foster and maintain positive health behaviour changes amongst individuals diagnosed with T2DM. Participants were connected with a single diabetes coach and were asked to partake in goal setting around their self-management behaviours. Participants' experiences with making and sustaining behaviour change were captured in the themes *heightened mindfulness of diabetes-related wellness* and *behaviour change guided by the participant*. The TPB was applied to better understand participants' experience with behaviour modification, a component of diabetes coaching.

The Theory of Planned Behaviour

The TPB was initially selected to understand participants' experiences with setting and attaining their self-management goals, as well as how the coach may have facilitated this process (Azjen, 1991). The theory was applied to a subset of interview questions to understand participants' intentions when entering the coaching experience. Participants

were probed about the importance of self-management to them, their desire to make changes and whether this translated to behaviour change while receiving coaching. While some elements of the theory applied to the findings, it did not fully capture the experience of behaviour change among participants who received diabetes coaching. Participants did perceive the self-management of T2DM as important and had intentions to change; however, these perceptions did not always translate to enacted behaviours to meet their self-management goals. This also applied to participants who previously enacted their desired behaviours, which based on TPB, should show greater perceived control (Azjen, 1991). TPB heavily underscores intention as fundamental to enacting behaviours. However, in the current study, an individual's source of motivation and contextual factors had a greater influence on whether the desired behaviour was performed.

The TPB does not account for external factors that influence an individual's intention such as finances, resources or comorbidities, as observed in the findings of this study (Azjen, 1991). Lastly, the TPB is limited in its application as it stipulates that an individual's decision making is linear and does not change once the intention is present. Participants in the present study described that even when they became mindful of how their self-management was proceeding and had intended to make changes, they did not always enact the necessary behaviours. Furthermore, as a linear model, the TPB is unable to account for participants failing to repetitively perform behaviours consistently both during the diabetes coaching experience and upon completion of coaching.

Motivation and Behaviour Change

Similar to the findings of Fazio et al. (2019) and Liddy et al. (2015), participants of the present study made positive behaviour changes and reached some of their goals during the coaching experience. However, neither study explored the sustainability of the behaviour changes made. In the present study, not all participants sustained their behaviour changes after coaching was finished. The findings explored under the lens of TPB suggest that while all participants set an intention to make positive behaviour changes, enacting and sustaining these changes were influenced by their motivation and other contextual factors. As a result, the ability of participants to make behaviour changes remained dependent on whether their motivation could be enhanced and external barriers could be addressed through coaching.

Similar to the findings of Liddy et al. (2015) and McGloin et al. (2015), many participants identified having a sense of accountability to the coach. This group of participants used the coach as their source of extrinsic motivation when making behaviour changes. The goal of SMS interventions including diabetes coaching is to foster independence in self-management (Clement et al., 2018; Sherifali et al., 2018). In contrast, some participants depended on the coach for supervision and did not want to disappoint the coach while discussing their self-management behaviours. Further, these participants identified that they did not continue with certain acquired self-management behaviours, such as monitoring their diet or reaching their daily steps after the coach was removed as an extrinsic motivator. These findings raised concerns around the benefits of coaching for long-term self-management since some participants showed a high level of

dependency on the coach for motivation. McGloin et al. (2015) reported a need for prolonged coaching to sustain the desired changes, since participants felt they would regress in the progress made during a three-month diabetes coaching intervention. Despite receiving coaching for 12 months, most participants in the present study corroborated these findings as they indicated a need for extended coaching and a gradual wean from the service.

In contrast, the subset of intrinsically motivated participants felt that diabetes coaching supported them in achieving their self-management goals. These participants were not only able to sustain the changes they made but did not feel they needed further coaching after 12 months. These findings indicate that for some participants, there is an endpoint for the perceived benefit of the intervention and the 12 months was for them, sufficient. This group of participants reported a desire to change when starting coaching which may indicate a higher level of readiness for change. Further, these participants showed initiative on their own by actively incorporating additional resources and strategies into their care plan. In this regard, diabetes coaching was a supporting factor to their own desires and efforts to make positive health changes.

The sole diabetes coach who took part in this study was trained in motivational interviewing and these techniques were supported by participants who described their approach as open, non-judgmental, encouraging, empowering and holistic. These findings corroborated the practice of motivational interviewing techniques when delivering coaching, as found in the studies by Dellasega et al. (2012), Liddy et al. (2015) and Fazio et al. (2019). Dellasega et al. (2012) examined the use of motivational interviewing alone

on behaviour change amongst adults with T2DM. One component of motivational interviewing includes discussions about an individual's intentions for change and addressing ambivalence they may present (Olsen & Nesbit, 2010; Sigal et al., 2018; Wolever et al., 2013). In the current study, participants' underlying motivators to complete their self-management goals varied. It is unclear whether participants were fully transparent with the coach about their motivation for change, which may impact the coach's ability to identify and address potential barriers. Future research exploring the perception of the coach and their awareness of participants' motivating factors would provide greater insight into the application of MI techniques in diabetes coaching.

The concept of implementing and sustaining health-related behaviour changes has been widely researched and numerous theories have been developed to explore this process. While it appeared that participants fell into two unique groups of motivation, self-determination theory (SDT) suggests that individuals can be found on a spectrum of motivation (Ryan & Deci, 2000). Ryan and Deci (2000) propose that individuals can be found anywhere from externally regulated by rewards and punishments to integrated regulation, where they come to value the behaviour being performed. Integrated regulation and intrinsic motivation are associated with greater likelihood of sustained behaviour changes (Ryan et al., 2008). Coaches can perhaps support individuals towards integrated regulation by exploring barriers to change as well as, the meanings ascribed to behaviours, in relation to their other goals and values (Ryan & Deci, 2000; Ryan et al., 2008). It is likely that participants who showed greater intrinsic motivation during coaching were already closer to developing this prior to coming into the RCT and did not

require the same support from the coach. While such participants may appear better suited for this intervention, others may probably have been able to transition to such a stage with a different coaching style or duration. It would be valuable for diabetes coaches to determine the level of motivation for their clients to be able to customize their coaching style. Participants who are identified as extrinsically motivated may require longer accountability measures and in turn, prolonged coaching. These participants may benefit more from coaching that explores their reasoning and perceived value of making behaviour changes. Future qualitative research applying SDT to diabetes coaching would further understand the varying degrees of motivation that exist for participants. Research designs that can follow participants as they work with the coach may be able to provide greater insight into their transition through such stages and how the coach can facilitate this.

Self-efficacy and Behaviour Change

Participants identified that coaching had given them a sense of greater control and empowerment with their diabetes self-management both through more knowledge and the ability to perform certain behaviours. A few participants felt that they had mastered their ability to independently self-manage without any further coaching. These findings suggest that participants may have gained more self-efficacy while working with the coach. Self-efficacy refers to an individual's belief in their ability to carry out a specific behaviour in a given context and is a key component of health behaviour changes (Holloway & Watson, 2002). Participants described feeling confident now that they had demonstrated the behaviours during coaching. Moreover, during their coaching

experience, participants described feeling encouraged in their efforts. These perceptions highlight the influence of both performance attainment and verbal persuasion; two primary ways in which self-efficacy can be cultivated (Holloway & Watson, 2002). As such, future research exploring the various domains of self-efficacy among participants as they work with a diabetes coach may shed light on how the coach may be able to foster this. Furthermore, coaches may find it beneficial to use validated self-efficacy scales as the Diabetes Empowerment Scale when working with clients not only for their initials assessments but to assess changes in self-efficacy throughout coaching (Anderson et al., 2000).

Mindfulness and Behaviour Change

The theme *mindfulness of diabetes-related wellness* captured how participants became more attentive towards their self-management behaviours, the impact on their overall wellness, influencing factors and areas for improvement. For some, heightened mindfulness related to more awareness surrounding the health choices they made during the coaching experience. For others, being more aware of their pattern of self-management behaviours and its impact did not always relate to the necessary behaviour changes. External factors ultimately posed a limitation for some in meeting self-management. These findings supported those of Walker et al. (2011), who found that individuals could only prioritize their health-related goals within the context of their overall imminent needs.

However, attaining such mindfulness around self-management behaviours can still be valuable in the broader context of behaviour change. Theories such as the

transtheoretical model of change postulate that behaviour change is cyclical in nature and requires individuals working through various stages of change (Prochaska & Velicer, 1997). The stages include no intention of change, readiness for change, carrying out behaviour changes, and finally, monitoring and maintenance of those changes. The contemplation stage of this model suggests that individuals need to become aware of potential pros and cons associated with making behaviour changes (Prochaska & Velicer, 1997). Diabetes coaching appeared to have a role in facilitating some of the required self-reflections around their self-management behaviours in order to increase their readiness for change. As it is common for individuals to become stagnant in the earlier stages, some participants may require a longer period of coaching to move from mindfulness to action of behaviours (Prochaska & Velicer, 1997). Future research could be focused on applying the transtheoretical model of change to the experience of diabetes coaching to further understand how some individuals sustained behaviour changes. This could also allow us to better understand how the coach can facilitate individuals into active stages of change.

Relational practice of Diabetes Health Coaching

Regardless of their ability to achieve their goals, participants shared that they valued the supportive relationship they built with the coach. Walker et al. (2011) had found that despite the same training, diabetes coaches in the PEACH trial had either taken on "treat to target" or "personalized approach." However, they were unable to determine the impact of these relationships on larger findings of the PEACH trial, as the approach for each participant could not be identified. Moreover, Walker et al. (2011) were unable

to gain any further insight into the impact of the two styles on the experiences of those with T2DM.

Diabetes health coaching is a client-centered intervention with a focus on empowering clients to drive their own self-management behaviour change (Sherifali et al., 2017). This is reflected in the theme *behaviour change guided by the participant,* as the level of motivation and readiness to make changes remains dependent on the client. For diabetes coaches to assist clients in making and sustaining changes, they must work with clients in exploring various facilitators and barriers to change (Hall et al., 2012). Therefore, applying relational inquiry whereby, coaches seek to understand the complex contextual settings of their clients inclusive of their relationships, occupations, social engagements, environments, socioeconomic status, accessibility of services, and culture is essential (Doane & Varcoe, 2007). The application and further development of relational practice for diabetes coaches would allow them to gain a better understanding of clients' goals, past experiences, values, interests, and apprehensions (Doane & Varcoe, 2007). These insights would allow coaches to customize their coaching styles and more effectively facilitate change.

In the current study, participants identified that the single diabetes coach had taken on a holistic, personalized approach. The coach engaged them in meaningful discussions around various contextual factors including but not limited to their experience with the diagnosis, perception of medications, presence of external supports, managing their diabetes in different environments, and other comorbidities. Therefore, participants felt they were able to develop comfort in discussing their diagnosis, address psychosocial

concerns, and be transparent regarding their self-management behaviours. The coach demonstrated relational practice by being thoughtful of and giving consideration to what was significant to participants (Doane & Varcoe, 2007). Findings suggest that the coach was able to explore other areas of concern for participants beyond clinical targets and achieving self-management goals. In particular, this was essential for several participants who had poor perceptions of their quality of life moving forward. Moreover, findings of the larger RCT by Sherifali et al. (2019) will be able to determine whether this personalized coaching approach was effective on clinically significant outcomes.

Delivery of Diabetes Health Coaching

Diabetes Coaching Model

Participants valued all four domains of the diabetes coaching model: case management and monitoring, self-management education, behaviour modification and psychosocial support. The findings suggest that participants found psychosocial support to be a more valuable domain of diabetes coaching. However, participants with underlying psychological concerns compounded by diabetes-related distress may require additional mental health services. It is therefore important for the coach to be connected to a range of services including additional mental health supports in order to be able to refer clients. Although participants did not discuss the role of the coach in providing system navigation, they described that dialogues with the coach had improved their comfort in communicating with other healthcare providers. It appears that not all participants required all domains of the coaching model equally therefore, the approach and focus taken on by the coach needs to be customized on an individual basis. Diabetes

coaches need to assess clients for their needs prior to initiating coaching. The findings suggest that diabetes coaches should explore clients' experience of living with the diagnosis, barriers to initiating insulin, experience with diabetes-related stigma, motivation and barriers to making behaviour changes, and readiness to make changes. By engaging in this initial assessment, diabetes coaches would be better able to customize and thus, support their clients.

Duration and Frequency

The duration and frequency of diabetes coaching provided should also be customized to meet the unique needs of each individual. Based on the present findings, individuals with less readiness for change or using the coach for extrinsic motivation may require prolonged coaching. It appears that these individuals found the end of coaching to be abrupt and would have benefited from a gradual wean from the support. Participants suggest that it may be most beneficial to offer diabetes coaching to individuals who are newly diagnosed suggesting that there may be a window of opportunity to establish good self-management behaviours from the start, which warrants further exploration.

Peer Coaching

Participants suggested the use of peer coaching to support weaning off working with the diabetes coach directly. Van der Wulp et al. (2012) conducted an RCT evaluating the effectiveness of a peer-led coaching intervention for individuals newly diagnosed with T2DM in the community. The intervention comprised contact through in-person, email and telephone calls with peer coaches. Results of the RCT showed that individuals in the intervention group that had reported low levels of self-efficacy and low psychological

well-being showed significant improvements in both areas following peer coaching (Van der Wulp et al., 2012). The literature on peer-led coaching shows potential benefits in self-efficacy and SME with conflicting results on glycemic control (Carpenter et al., 2019). Further research exploring the use of peers for long-term behaviour changes as well as, the recruitment criteria and training for peers is needed. As findings of the present study suggest there remains a need for more psychosocial support and additional support from peers who have similar shared experiences may be beneficial (Carpenter et al., 2019).

Technology

Participants identified that the delivery of diabetes coaching through the telephone was convenient and flexible making it easier to access amid other commitments. There is some evidence to suggest that further supplementing this with smart-phone features may further enhance the engagement experienced by participants (Pludwinski et al., 2016). The use of photos to communicate meal choices or applications to allow both participants and coaches to track changes in blood glucose levels may allow for more efficient, appropriate feedback (Pludwinski et al., 2016).

Study Strengths

The present study has several strengths allowing the findings to contribute to the existing literature on diabetes coaching. Firstly, participants only received the diabetes coaching intervention from a single coach who was a Registered Nurse and Certified Diabetes Educator with additional training in motivational interviewing, behaviour modification and diabetes coaching model (Sherifali et al., 2019). The use of the diabetes

model proposed by Sherifali et al. (2019) provides a breakdown of areas that the diabetes coach focused on in delivering coaching. As such, this is the first qualitative study to focus on exploring the delivery of a diabetes coaching intervention not influenced by the variability of coaching styles, training, or frequency of delivery. Secondly, an acceptable sample size of 12 participants was interviewed until there were no new emerging ideas. The rigor of the interpretations made was ensured by reflexivity and discussions with the research supervisor and committee throughout the thematic analysis. In addition, interviews were conducted via telephone to provide comfort and flexibility, which mirrored the delivery of the intervention. Lastly, this is a subsequent study following a larger RCT examining clinical outcomes for the same diabetes coaching intervention, therefore, adds valuable experiential data that will supplement the quantitative findings.

Study Limitations

Conversely, there are also some important limitations to consider when examining the findings of the present study. Firstly, despite an extension of the recruitment period for an additional six months, interviews with unfavourable experiences of diabetes coaching were not captured leading to potential participation bias. In an effort to account for this, a probe asking participants who this would not be suitable for was added to later interviews. Further, since all interviews captured either a positive or indifferent experience indicative of a positive engagement and rapport with the coach, participants may have been reluctant to provide negative feedback or criticism. The use of telephone interviewing may not have captured some of the non-verbal communication of participants from both body and facial expressions. The mean age for participants was 62

years and no participants under the age of 46 or over 75 were not captured in this study. As such, findings are limited in transferability to much younger or older adults who may not require different types of support. Secondly, participants varied in their time of enrollment into the present study following completion of diabetes coaching creating variability in their periods of time for reflection of their experience. Thirdly, more than half of the participants in the present study had access to a range of services and healthcare provides through previously existing community health centres. As such, the diabetes coach was able to refer and recommend participants to programs easily, which may not be readily available in other settings. More than half of the participants in the present study identified having completed post-secondary education, which may not be representative of the population presently living with T2DM. Individuals with higher education have been identified as less likely to have various modifiable risk factors for T2DM such as obesity, physical inactivity, inadequate consumption of fruits and vegetables, and tobacco use (Public Health Agency of Canada, 2011). While these risk factors were not formally assessed, they were present among participants of the study. Lastly, the present study findings are further limited in transferability as a convenience sample was utilized and participants were all recruited from the Southern Ontario region with prior access to a community diabetes program.

Implications and Recommendations

Clinical Nursing Practice

The findings highlight the importance of diabetes health coaching being a relational practice. As such, clinical practice settings need to facilitate this by considering the acuity of clients, and time for coach-client meetings. It is suggested that an initial meeting with clients prior to initiating coaching would beneficial to foster this relational practice. This would provide coaches with an opportunity to gauge participants' reasons for working with a diabetes coach, barriers and facilitators to self-management, access to resources, and other critical contextual influences. This would allow diabetes coaches to tailor their coaching approach to meet the unique client needs. They would be able to provide more consideration for how well the client has adapted to the diagnosis, presence of comorbidities including mental health concerns, and examination of motivation and readiness for change thereby, ensuring more holistic care.

The diabetes coach should optimally practice within an interdisciplinary team model (in person or virtually), to connect with specialized care (e.g. endocrinology), as well as primary care providers for each patient. It is recommended that the diabetes coach have access to appropriate mental health services as part of this team. Diabetes coaches may be able to serve as a point of access in referring clients to appropriate mental health services by screening for diabetes-related distress and depression using the appropriate tools.

Nursing Education

Registered Nurse with a certified diabetes educator designation would optimally deliver diabetes coaching to provide adequate education and training regarding diabetes, and the use of medications and insulin in accordance with clinical practice guidelines. To optimally enact the role of diabetes coaching, education and training for coaches should incorporate various behaviour change theories (self-determination theory, transtheoretical model of change) to ensure that a more well-rounded perspective of the complexities around behaviour change is recognized, understood, and utilized in practice. Education should include an understanding of key factors that support behaviour change such as individual motivation, self-efficacy, and readiness for change. Coaches should be trained in the appropriate use and delivery of motivational interviewing techniques to foster open, non-judgemental engagement (Hall et al., 2012). It is suggested that coaches seek to engage clients in discussions around motivating factors for change, potential facilitators and barriers to change, and address areas of ambivalence.

Emphasis on the recognition and mitigation of T2DM stigma is also crucial, as this will further support the coach-client relationship and the client's ability to self-manage their T2DM. Coaches and other providers supporting individuals with T2DM need to be trained in recognizing and preventing stigma created by HCP. Education should focus on building relationships with clients that are open, engaging, and non-judgmental to allow for more transparent, holistic communication.

Further, coaches should be trained to assess and recognize signs of psychological insulin resistance, the potential barriers, and how to work with clients to facilitate this

transition as early as clinically appropriate. This may start with open and honest discussions, using motivational interviewing to understand the values and beliefs regarding insulin use and resistance (Hall et al., 2012). Recognizing that psychological insulin resistance may contribute to diabetes-related distress, coaches must be aware and have the tools to assess and support clients experiencing diabetes-related distress, associated signs and symptoms, and strategies to assist with coping.

Health Policy

Recognition and support for the transition from traditional content-based educational programs to evidence-based coaching interventions rooted in behaviour change theories including self-determination theory and transtheoretical model of change are warranted. This reflects broader shifts in diabetes management, specifically one that recognizes the need for both self-management education and support.

Future Research

Future research exploring the perception of diabetes coaches would provide further insights into some of the facilitators and barriers of delivering a coaching intervention to optimize its implementation. It would provide a better understanding of how coaches come to assess a client's needs and customize the coaching that is offered. It is suggested that perhaps, analyzing data from coach-client sessions would provide greater insight into the relational work provided by coaches and how this can be incorporated into training programs.

Quantitative research to evaluate what types of self-management behaviours individuals who have received diabetes coaching are adopting (i.e. regular attendance for

retinal eye and foot exams, screening, and treatment for nephropathy, taking medications appropriately, physical activity, etc.) and maintaining. As well as, the application of other behaviour change theories, such as self-determination theory and the transtheoretical model of change to qualitative explorations of diabetes coaching to better understand the experience of clients making behaviour changes while working with a coach. The use of a grounded theory approach and multiple interviews with participants as they move through a coaching program may be beneficial to better understand the complex nature of behaviour change as a process. This would allow for the implementation and evaluation of coaching interventions that are geared at sustaining behaviour changes.

The array of experiences provided by participants further support the need for quantitative research to evaluate patient-reported experience outcomes as well. There is a need for the development of self-reported tools to assess diabetes-related stigma amongst individuals with T2DM. Valid and reliable tools assessing stigma are needed to evaluate the effectiveness of diabetes coaching as an intervention to decrease this psychosocial concern. As a relational practice, it would be valuable to explore the experience of diabetes coaching amongst diverse populations with different cultural experiences related to T2DM. Finally, participants received telephone-based diabetes coaching in the current study. As such, it would be worthwhile to explore whether more advanced technology-facilitated diabetes coaching is an intervention that is of interest to individuals living with T2DM, particularly in light of the COVID-19 pandemic and the need for virtual care. This may include the use of smartphone applications or video calls.

Chapter Six

Conclusion

Type 2 diabetes mellitus (T2DM) is a chronic condition impacting a growing number of adults both in Canada and globally. Individuals with T2DM are required to develop self-management skills in order to not only live with the diagnosis but to prevent further complications. More recently, diabetes coaching has emerged as a patient-centered self-management support focused on empowering clients to take an active role in goal setting, monitoring their health, and working through problems as they arise. The purpose of this study was to better understand the perceived experience of receiving telephone-based diabetes coaching to determine how it may need to be optimally delivered to better meet client needs. The findings of the study shed light on the complexity of not only managing this chronic condition but also making and sustaining self-management behaviour changes. Individuals diagnosed with T2DM have to adapt to the diagnosis and come to accept it as part of their lives by addressing any misconceptions, learning about the condition and how to better self-manage, and tackling any apprehensions in treatment plans. It appears diabetes coaching was able to support participants with this adaptation by addressing several influencing factors including the presence of stigma surrounding the condition, psychological insulin resistance, and diabetes-related distress. Moreover, the process of making and sustaining self-management behaviour changes remains multidimensional, complex, and unique to each individual. An exploration of coaching using various behaviour change theories including SDT and transtheoretical model of change is recommended to develop interventions geared at sustaining behaviour changes.

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Appendices

Appendix A

Literature Search and Review

Table 1: Literature Search Summary

The following databases were searched: PubMed, CINHAL, Ovid (EMBASE & PsychINFO) and Google Scholar. The following key terms were used in various combinations in the search strategy: type 2 diabetes*, non-insulin dependent diabetes, health coach*, diabetes coach*, coach*, nurse-led* and community-based. The term qualitative was also combined. The search was limited to publications from 2010 to present date, involving adults over the age of 18 with a diagnosis of Type 2 diabetes mellitus and in English. Literature looking at pre-diabetes and prevention, type 1 diabetes mellitus and gestational diabetes, inpatient studies and those that did not refer to the self-management intervention as coaching were excluded from the study. There was an overlap in search findings between databases and articles included within systematic reviews. A total of 14 articles were included in the literature review.

Database Search	Total No. of Hits	No. of Selected Articles
OVID (PsychINFO & EMBASE)	75	10
type 2 diabetes AND health coaching	7	
type 2 diabetes AND diabetes coaching	73	
type 2 diabetes AND health coach*	16	
type 2 diabetes AND diabetes coach*	6	
type 2 diabetes AND nurse-led* AND coach*	30	
type 2 diabetes AND coach* AND qualitative*	5	
type 2 diabetes AND coach* (limit to systematic reviews)		
CINHAL		8
type 2 diabetes AND diabetes coach*	2	
diabetes coach*	10	
type 2 diabetes AND health coach*	33	
type 2 diabetes AND coach*	76	
type 2 diabetes AND coach* AND nurse-led*	1	
type 2 diabetes AND coach* AND qualitative	2	
PubMed		19
type 2 diabetes AND health coaching	100	

type 2 diabetes AND diabetes coaching type 2 diabetes AND diabetes coach* type 2 diabetes AND health coach* non-insulin dependent diabetes AND diabetes coach* non-insulin dependent diabetes AND health coach* type 2 diabetes AND diabetes coach* AND community-based type 2 diabetes AND nurse-led* AND coach* type 2 diabetes AND coach* AND qualitative	109 1 56 1 49 0 2 12	
Google Scholar type 2 diabetes AND health coaching type 2 diabetes AND diabetes coaching type 2 diabetes AND health coach* type 2 diabetes AND diabetes coach* type 2 diabetes AND nurse-led* AND coach* type 2 diabetes AND coach* AND qualitative type 2 diabetes AND coach* AND qualitative	15800 15800 16200 16500 3000 16300 17000	39

Table 1b: Selected Literature

Concept	**Research Design**	**No. of Articles (n=12)**
Health coaching	Systematic reviews	3
Diabetes health coaching	Systematic reviews Single randomized controlled trial	2 1
Experience of diabetes health coaching	Qualitative	6

Appendix A

Table 2: Critical Appraisal of the Literature

Study (author, year, country)	**Question/Topic**	**Methodology**	**Population/ Setting**	**Intervention/Comparison and Outcomes**	**Critique**	**Significant Findings/ Relevance**
Kivela et al. (2014)	To examine type of effects of health coaching on adult patients with chronic diseases.	Systematic Review • 13 articles included between 2009 and 2013 • US (8), Thailand (2), Malaysia (1), Finland (1), Sweden (1) • Randomized controlled trials (11) & quasi experimental (2)	• Adults (18 or older) with at least one chronic illness (excluding mental illness/disabilities) • 3 studies focused on T2DM • Range of chronic illnesses (T2DM, coronary artery disease, congestive heart failure, weight management, rheumatoid arthritis, cancer pain) • Recruited from primary care and community clinics	**Intervention:** • Health coaching delivered by healthcare providers • Nurse-led coaching (6) • Modalities: telephone (5), internet, face-to-face • Duration (3 weeks to 18 months); most used 6 months **Control:** usual care (for RCTs) **Outcomes:** • Clinical (HbA1C, weight, cholesterol, blood pressure, BMI), behavioural (self-care, physical activity, medication adherence), psychological (self-efficacy, stress, QoL, perception of illness)	**Strengths:** • Used Critical Appraisal checklist (10 quality assessment criteria) for inclusion **Limitations:** • Findings synthesized by narrative • Meta-analysis not done due to variability in methods/results • Use of unregulated professionals (fitness, healthy lifestyle and education coaches) • Some studies had measured psychological	• 11 of 13 studies reported statistically significant results (across the four domains) • Most improved physiological outcomes (weight loss, improved health status and HbA1C); behavioural (physical activity); positive psychological outcomes (self-efficacy and mental health status); 2 studies showed improved social support **Findings relevant to T2DM:** • 2 studies showed significant decrease in HbA1C and 2 showed no significant changes • 2 studies showed improved self-care behaviours (diet; foot care) in 6 months • Lowered depressive symptoms at follow-up (1), improved QoL (1), greater perceived social support during intervention (2) **Conclusions:**

				and social (self-efficacy, communication with providers, access to resources)	and social outcomes together	• Health coaching showed significant changes in different areas in those with T2DM • Large variation in method, application and duration of health coaching interventions; unable to determine effectiveness • Potential for health coaching to be an effective patient education method for chronic illnesses • Supports need to understand structure and delivery of health coaching and its long-term impact further
Olsen & Nesbit (2010)	To examine health coaching interventions for effectiveness and to identify key features **Research questions:** 1. How effective are health coaching interventions for improving healthy lifestyle behaviours? 2. What are the key features of an effective	• Integrative review • Included 15 studies between 1999 and 2008 • Randomized controlled trials (6), quasi experimental (7) and qualitative (2)	• Both children and adults with complex care needs and/or chronic illnesses • Single study focused on only adults with T2DM	• No meta-analysis conducted due to variation in methodology • Studies analyzed for purpose, method, intervention, findings and critique and scored for methodological quality based on 5 criteria	**Strengths:** • Looked at a range of available literature to date • Clearly presented table describing all individual studies **Limitations:** • Large variation in populations including children • Large variation	• Review highlighted the earlier literature on health coaching to date • Findings suggested that health coaching may be beneficial to improving lifestyle behaviours such as: nutrition, physical activity, weight management or medication adherence • Key features of health coaching interventions: goal-setting, motivational interviewing, collaboration with a primary healthcare provider, and program

	health coaching program?				in methodology; did not allow for statistical comparison of studies • Quality of articles assessed by schema developed by authors • Similar interventions not referred to as "health coaching" may have been excluded	from 6 to 12 months in duration • Nursing identified as most common discipline providing coaching • Findings emphasize need for clear conceptualization and definition for health coaching • Findings support the need for rigorous studies on health coaching to evaluate effectiveness of various approaches including training for professionals
Wolever et al. (2013)	Review of peer-reviewed literature for definition and operationalization of health and wellness coaching.	• Integrative review of 284 full-text articles • Majority (185) were quantitative; 31 were protocols of studies yet to be implemented ; 37 were already implemented	• Patient populations not specified; articles include diverse population of adults and children with chronic conditions • Unclear	• Review of both qualitative and quantitative designs • No meta-analysis conducted due to variation in methodology • Analyzed all included studies for prevalence of different elements of coaching	**Strengths:** • Used PRISMA to appraise quality of studies • Articles reviewed independently by 3 different people **Limitations:** • Inclusion of wellness coaching is broader; may	• Provided an early overview of descriptions of health and wellness coaching interventions to date • Overview of the variation in coaching interventions being applied • Interventions varied in: techniques applied; theoretical understanding; frequency and length of delivery; methods of contact with • Areas of consensus found in literature were: • Patient- centered:

		and unevaluated practices; 31 were concept papers with no data	how many studies focused on T2DM		deviate from application to chronic health conditions • Search limited to only PubMed • Large variation in populations • Large variation in methodology; did not allow for statistical comparison of studies • All studies did not report on all assessed measures; 1/3 of studies did not report full and coaching methods and ½ did not specify training details for coaches • Potential bias: larger percentage of conceptual articles report coaching as patient-centric	goals partially/fully developed by patients • Self-discovery/active learning processes with content education to meet goals • Accountability: self-monitoring of behaviours • Interpersonal relationship with coach • Coach is healthcare professional trained in behaviour change theory, motivational strategies and communication techniques (as opposed to conventional medical models) **Conclusions:** • Large variability in definitions of health and wellness coaching have posed a barrier in conducting rigorous meta-analyses or systematic reviews • Need for evidence-based universal definition for

					and discuss a long trajectory for training coaches. Conceptual articles also cite greater use of nurses and mental health workers.	studies on efficacy and effectiveness and consistency in professional training • Need for evidence-based universal definition in order to evaluate which amount of each component is effective for desired health outcomes for specific conditions and patient populations to establish best practices • Areas for future research include: defining the role of the coach (ie. Providing content education, playing multiple roles, dual clinician-coach role); individualized vs. protocol-driven approaches; leveraging technology
Sherifali et al. (2016)	To synthesize the evidence on health coaching and its effect on adults with type 2 diabetes including glycemic control, self-care behaviours and QoL measures.	• Systematic review • 8 randomized controlled trials between inception to 2015 • United states (4); Turkey (1); South	• Adults diagnosed with T2DM • 5 studies included elevated A1C measures • Inclusion remains unclear for	**Intervention:** • Health coaching • Duration ranged from 3-10 months • Modalities: telephone only (4); face-to-face (1); face-to-face with phone (2); internet (1) • Nurse-led coaching	**Strengths:** • First meta-analysis of health coaching for adults with T2DM • Rigorous search and screening using PRISMA	• Health coaching is effective at improving glycemic control (A1C levels) in adults with T2DM • Statistically significant decrease in A1C of -0.32%; greater decrease seen with long term coaching over 6 months • Common elements of coaching interventions:

		Korea (1); Finland (1); Australia (1)	study by Varney et al. (2014)	(4); dentist (1); dietician (1); medical assistant (1); social work/ psychology (1) **Control:** traditional health education/ usual care/ standard brochure education **Outcomes:** • Physiological (A1C levels)	**Limitations:** • Studies published in English only • Focus on effect on A1C • Were not able to analyze self-care or QoL measures due to limited reporting	goal setting, acquisition of diabetes knowledge, individualized care, frequent follow-ups • Favours supplementing routine/ standard diabetes-care practices with coaching to improve glycemic control **Areas for future research:** • Impact on other diabetes-related outcomes: healthcare utilization, QoL and self-efficacy • Fidelity of coaching (training/education implementation, adaptation across healthcare systems)
Pirbaglou et al. (2018)	To systematically review the impact of personal health coaching (PHC) programs on glycemic management and related psychological outcomes (distress, QoL	Systematic review • 22 randomized controlled trials between 1990 and 2017	• Adults diagnosed with T2DM • Peer reviewed RCTs evaluating impact of personal health coaching on glycemic control	**Intervention:** • Personal health coaching • Duration ranged from 2-18 months • Modalities: telephone only (6); telephone with face-to-face (9); telephone with electronic monitoring/feedback (3); electronic	**Strengths:** • Larger, more comprehensive review of PHC on T2DM • Included studies with electronic monitoring/feedback • Inclusion of psychological outcomes	• Personal health coaching (PHC) is effective in improving glycemic control (A1C levels) at different follow-up periods • Greatest statistically significant difference after 4-6 months of PHC of -0.5% • Limited findings in psychological outcomes • 3 of 13 studies that reported on psychological distress found statistically significant

	and self-efficacy).		• Excluded studies focused on a single behaviour goal, prevention of T2DM, not focused on self-management of T2DM, use of automated feedback	monitoring/feedback (1); face-to-face with electronic monitoring (1); all 3 combined (3) • Nurse-led (9) **Control:** usual care; educational brochures; standard diabetes education **Outcomes:** • Physiological (A1C) • Psychological (distress; QoL; self-efficacy)	• Rigorous search and screening using PRISMA **Limitations:** • Conventional RCTs were ore effective than clustered RCTs; may have been due to longer follow-ups, lack of program intensity, control receiving enhanced care • Lack of information regarding medication adherence, changes to medication regimens, changes to self-management tasks and other lifestyle tasks taken on by patients that	reduction in diabetes-related distress • Only 1 of 10 studies that evaluated QoL found statistically significant improvement in QoL score • Only 1 of 4 studies that reported on self-efficacy beliefs in relation to T2DM reported a statistically significant increase in self-efficacy **Areas for future research:** • Qualitative studies examining the challenges faced by those with T2DM and how PHC impacted their self-management in order to understand how it is utilized • Examination of the effectiveness of PHC program components (different modalities, delivery contexts, training etc.) • To examine how PHC should be optimally supplemented with other pharmaceutical, lifestyle-based and

					may have confounded results • Not all studies reported psychological outcomes with variation in evaluation tools used	psychoeducational approaches
Wayne et al. (2015) **Canada**	To evaluate the effectiveness of mobile phone-based health coaching versus without a mobile phone in reducing HbA1c levels in patients with T2DM.	• Non-inferiority pragmatic RCT	• Adults diagnosed with T2DM with an HbA1C equal to/greater than 7.3% and under the age of 70 • Recruited from 2 primary care sites in Toronto, Ont. • Lower SES community (90% of sample)	**Intervention:** • Health coaching facilitated through mobile monitoring and feedback • Ongoing immediate attention 24hrs/day x 7 days/week for 6 months • 6 health coaches with degrees in kinesiology and health sciences (5 certified exercise physiologists and 1 personal trainer) • Coaches trained in behaviour change counseling and	**Strengths:** • Randomization performed with all participants having access to care and equal chance to be in either group • Statistical analysis carried by 2 independent research assistants and tests described **Limitations:** • Goals primarily focused on increasing physical activity and	• Only RCT evaluating the use of health coaching for T2DM within the Canadian healthcare system • No significant difference between groups in HbA1C levels from baseline to 6 months • Both groups showed significant reductions of HbA1C levels within groups • Intervention group with access to mobile device assistance showed significant faster reduction in HbA1C at 3 months compared to control (0.52%) • Intervention group showed significant reductions in body weight (1.22kg) and waist

				chronic disease management • Coaching to work on health-related goals and monitoring daily progress • Used the Connected Wellness Platform which allowed for self-monitoring and communication with health coach **Control:** • Health coaching by the same professionals delivering the intervention without mobile monitoring/feedback • All participants in both groups had access to Black Creek Community Health Centre's free Exercise Education Program	diet modifications • Validity of scales used to measure secondary psychological outcomes unclear • Large number of participants did not complete psychometric surveys at follow-up • Predominantly lower SES community with poorly controlled T2DM	circumference (2.23cm); no changes found in BMI for both groups • Findings suggest that there may be some additional benefit of having the mobile Connection Wellness Platform software with achieving physiological outcomes • Significant reduction in negative affect found in intervention group • Psychological well-being of overall sample improved at 6 months (satisfaction with life and hospital anxiety and depression scales); no between group difference reported • Only Canadian RCT but is not examining the effectiveness of health coaching • Use of unregulated healthcare professionals may have caused even greater variation in training and skills **Areas for future research:**

				Outcomes: • Primary: physiological (A1C levels at baseline and post 6 months) • Secondary: physiological (weight, BMI, waist circumference); psychological (satisfaction with life scale, hospital anxiety and depression scale, positive and negative affect schedule, short form health survey)		• Study by Pludwinski et al. (2015) examines the qualitative angle of these findings by looking at the experience of those who received the intervention • To determine intensity and duration of for optimal delivery of coaching interventions • Evaluation of various technological platforms that may be utilized (optimization and cost effectiveness)
Howard & Hagen (2012) **Canada**	To examine the experience of individuals with T2DM who had participated in a health coaching intervention.	• Qualitative phenomenological hermeneutic research design • 2- hour in-person semi-structured interviews	• Adults diagnosed with T2DM • 3 participants • Rural area of western Canada • Had to have received minimum of 6 coaching intervention sessions	**Coaching intervention received prior to study:** • Community-based chronic disease management program • Delivered by nurses trained in motivational interviewing, chronic disease	**Strengths:** • Design/methods fits the chosen qualitative exploration **Limitations:** • Small sample size; data saturation most likely not reached	Three major themes were identified: 1. Driving force coaches worked with participants to identify their internal motivators for wanting to change 2. I am not a child participants wanted to maintain a level of autonomy and control

				management and health behaviour change • 2 initial group education and support with self-management classes followed by subsequent individual coaching sessions (every 3- 12 months)	nor reported; hard to acquire maximum variation • Short recruitment period • Intervention was not tailored for management of T2DM • Large gap between individual coaching sessions (low frequency of contact with coach) • Delivery of coaching and training of coaches unspecified • Lack of member checking and/or researcher triangulation	within their relationships with the coach 3. Meeting the inner coach participants being able to recognize their own knowledge and wisdom • Weaker study with small sample size and the intervention not designed for T2DM • Provides preliminary glimpse into participant perspectives and how coaching is being utilized • More qualitative studies needed with bigger sample and focus on T2DM
Walker et al.	To explore the delivery process	Qualitative study • Grounded	• Adults diagnosed	**Coaching intervention received**	**Strengths:** • All coaches	• One of the only studies to evaluate the coaching process

(2011) **Australia**	of a telephone coaching intervention provided by nurses to individuals with poorly controlled T2DM.	theory • Analyzed transcripts of telephone conversations between coaches and participants from a larger RCT • Included 14 telephone conversations conducted by 6 different nurses	with T2DM • Community practice setting in Victoria, Australia	**prior to study:** • Patient Engagement and Coaching for Health (PEACH) project • Nurses recruited and trained over 2 days to deliver coaching • Trained using a didactic approach on nutrition, exercise, medication adherence, testing protocols and target glycemic levels • Coaches were instructed to motivate clients to make lifestyle changes, follow medication regimens and improve collaboration with primary care physicians • Participants had access to 8 coaching calls over 18 months	were trained/directed in the same way **Limitations:** • Did not identify any model/structure (ie. motivational interviewing) for training • Variability in coaches • Coaching transcripts from various time points taken; unclear whether transcripts covered both initiation and ending of sessions • Minimal intensity of coaching calls provided; participants may have clustered all	• All calls had followed a semi-structured approach • All nurses had utilized protocol questions around medications, lab results, diet and exercise and provided suggestions for improvement • Delivery of coaching happens in unique social contexts for each participant where prioritization of health-related goals remained dependent on other needs • Coaches took on a "target to treat" or "personalized care" approach **Areas for future research:** • Evaluating which approach leads to better clinical outcomes • Evaluating whether the approach may change with different duration/intensity of coaching • Examining variations in delivery approach with evidence-based structured training

					calls	
Dellasega, Anel-Tiangco & Gabbay (2012) **United States**	To determine how patients with T2DM responded to the use of motivational interviewing to promote positive behaviour changes.	• Qualitative study • Four focus group discussions • Across and within group analysis of focus group transcripts • Interpretive phenomenological analysis	• 19 adults with T2DM who had participated in a larger RCT examining the effect of motivational interviewing on behaviour changes in those with T2DM • Family or general medicine practice clinics • 2 groups were primarily Hispanic and low-income; remaining 2 from academic primary care clinics	**Diabetes Nurse Case Management with Motivational Interviewing for Change (DYNAMIC) RCT** • 3 Registered nurses trained over 4 months in T2DM and motivational interviewing • Training for motivational interviewing included: role playing, videoconferencing, journal article reviews, conferences/lectures, mock interviews • Nurses also followed a T2DM management protocol addressing blood glucose, hypertension, hyperlipidemia and depression • Patients seen at baseline, 2, 4 and 6 weeks and then minimum of every	**Strengths:** • Comparison of intervention and control group experiences • Fidelity of intervention was conducted by an MI-certified psychologist who provided continuous feedback to ensure adequate delivery of motivational interviewing techniques • Point of data saturation was reached • Researcher triangulation was used with 4 members individually analyzing transcripts • Attrition due to intervention	• Focus of study was limited to motivational interviewing alone (key component of many coaching interventions) • All findings demonstrated positive feedback and receptivity towards MI intervention for high risk patients with T2DM • Following 5 themes were identified: 1. Non-judgmental accountability open dialogue and responsibility for their own care allowing for open/honest conversations about their lifestyle decisions 2. Being heard and responded to as a person felt the nurses had given them time to discuss concerns/fears and paid attention 3. Encouragement an empowerment

				3-6 months (all sessions were 1 hour) • Initial assessment included: lab results, medication review, exploration of patient goals, view of diabetes management and overall health • Control: usual care	was less than 10% **Limitations:** • Potential participation bias as no negative feedback regarding MI intervention was received • Lack of quantitative data around population demographics • Limited in application as nurses had both extensive training and ample time for each session	through empathy were more receptive to suggestions and comments 4. Collaborative action planning and goal setting formed partnerships with nurses and utilized nurses as resources to guide them in making realistic goals 5. Coaching rather than critiquing felt nurses offered more guidance and support where standard care felt more rushed and paternalistic • Findings suggest that the use of motivational interviewing in training coaches may be beneficial for behaviour change • Further research would need to examine whether

						a shorter training period would be just as effective in incorporating these strategies
Fazio et al. (2019) **United States**	To explore the various types of successes experienced by adults with T2DM who participated in a technology-enabled nursing-led health coaching trial.	Qualitative analysis • Data included surveys (open-ended questions regarding experience) and documentation from coaching sessions between nurses and participants (goal progress notes) • Reviewed data from 132 cases • Thematic analysis through iterative process	• English-speaking adults with T2DM who had received the intervention of the larger trial and completed all 6 coaching sessions • Primary care clinics in Northern California	**Patient and provider engagement and empowerment through technology (P^2E^2^T^2) Trial intervention:** • 6 Registered nurses certified in motivational interviewing • Participants received 6 bi-weekly telephone coaching sessions • Nurse coaches worked with participants to self-identify goals, assist in prioritizing and recognizing barriers • Sessions were documented with progress notes including evaluations of progress made by both nurses and participants	**Strengths:** • Large sample for qualitative research • Data saturation reached after review of 35 cases with research team consensus on coding scheme • Descriptive statistics of demographics provided **Limitations:** • Use of self-reported data and no interviewing may have been limiting in seeking clarifications and greater depth • Use of nursing documentation may have	• 96% of participants reported some level of positive change in overall health or ability to manage their diabetes • Participant goals were found to be focused around: physical activity, diet, medications and mental health • Type of experiences described by participants fell into 5 of the following themes: 1. Change in health behaviours 2. Change in mindset/awareness 3. Change in engagement with healthcare resources 4. Change in physical or emotional health 5. Change in health indicator • Qualitative findings suggest that there is a range of successful

				• Nurse coaching sessions with use of personal health tracking technological platforms (MyFitnessPal and a fitness tracking watch) • Both platforms were integrated into their electronic patient chart • Control: usual care	introduced bias • Descriptive study; limited in exploring degrees of success • Possible selection bias as 96% of participants reported positive experience	experiences for participants outside typically measured clinical values (eg. A1C) • The use of nurse-led coaching may be a valuable supplement to engaging individuals in self-management and making health-related behaviour changes • Clinical outcomes of larger RCT not published **Areas for future research:** • Remains unclear whether findings are influenced mainly by having access to a coach or the technological platform or combination of both • To assess these findings in relation to the clinical outcomes of the larger RCT (how does this relate to success as defined by the larger trial) • To assess whether the changes described by

						participants are temporary or sustained over time • Using other qualitative approaches to gain deeper understanding of these experiences
Liddy et al. (2015) **Canada**	To examine both patients' experiences with and perceptions of health coaching as a form of ongoing care.	Qualitative study • Semi-structured interviews • Thematic analysis conducted	• Adults who were at risk or already diagnosed with T2DM • 11 participants who were enrolled in a health coaching pilot program • Participating clinics that offered team-based care to those with chronic disease (2 family health teams and 1 community health centre) • Primary care providers helped identify participants they felt would	• 11 hours of training was provided to coaches including training on the Peers for Progress model (adapted for healthcare), transtheoretical model of behaviour change and motivational interviewing techniques • Total of 6 coaches (3 has previous training in motivational interviewing and 3 were certified in diabetes education) • Initial in-person meetings followed by subsequent sessions through e-mail, telephone, face-to-face or combination	**Strengths:** • Stratified sampling to obtain maximum variation; adequate sample size for design • Researcher triangulation was done by having 5 different members analyze data • Data saturation reached **Limitations:** • Possible participation bias as no negative feedback	• Study also looked at prevention by including participants who were at risk for developing T2DM • All patients perceived their experience with health coaching to be positive • Patients found the health coaching program to be effective in the following 3 areas: 1. Increasing awareness of how diabetes impacts health 2. Increasing accountability for health related behaviours 3. Improving access to

			benefit the most		received • Possible selection bias as primary care providers approached those they felt would benefit most from the intervention • Variation in underlying training and skills of coaches • Participants previously had access to primary healthcare and interprofessional health teams	healthcare resources **Areas for future research:** • Would be valuable to examine which modality and frequency suits participants as there was variation in this study • Using other qualitative approaches to gain a deeper understanding of these experiences
McGloin et al. (2015) **UK**	To examine the effectiveness of the use of telephone empowerment-based health coaching as a cost-effective alternate to changing health behaviours among adults	Case study • Mixed methods study • Phase 1: measures of physiological baseline data • Phase 2: three- month telephone-based	• Adults with T2DM • Recruited through poster advertising or referral by diabetes nurse specialist • Clinic at large	**Intervention:** • Implemented a 5-stage goal oriented verbal approach • Telephone-based coaching delivered through Skype calls at baseline, weekly x 4weeks followed by bi-weekly for remaining 8; total 3	**Strengths:** • Triangulation; use of various data collection methods to strengthen validity • Mixed methods; provides qualitative data to supplement	**Physiological Findings:** • No significant change in HbA1C levels or blood pressure • Significant decrease in weight and waist circumference at 3 months; increased again at 12 months • Daily energy expenditure increased at 3 months but decreased starting at 6

	with T2DM	diabetic health coaching • Phase 3: survey data at 3, 6 and 12 months • Phase 4: focus group interview; thematic analysis conducted	regional hospital	months of coaching • Professional background of coach unspecified **Outcomes:** • Physiological data: HbA1C, blood pressure, weight, BMI, waist circumference at baseline, 3, 6, and 12 months • Questionnaires: self-reported physical activity levels, stages of change in relation to exercise; self-efficacy and emotional distress • Focus group: exploration of expectations, achievements and opinions	quantitative findings and more depth to self-reported survey data **Limitations:** • Very small size • Only 8 participants completed full intervention • Study does not identify inclusion/exclusion criteria • Family members also included in focus group • Professional background of coach not specified	months **4 Major Themes from Last Call:** 1) Processes of Change → participants voiced need for ongoing support to sustain changes (looking for support amongst friends; joining weight watchers); examining counterconditioning strategies for problem behaviours 2) Lapses →temporary slips due to overconfidence, temptations or self-blame; examining lapse vs relapse 3) Accountability → achieving goals to continue reinforcement from coach 4) Ambivalence → to resolve emerging conflicts around behaviour change **3 Main Themes from Focus Group:** 1) The ingredients of coaching: encouragement, no judgement, empathy, choice, listening 2) Outcomes achieved: participants felt they made improvements (feeling better, feeling fit, more energetic); gaining control

						3) Continuing support: need for prolonged coaching **Areas for Future Research:** • Impact of extending the coaching intervention past 3 months • Using larger sample sizes from diverse regions to determine effectiveness of sustaining behavioural changes long-term • Support for exploration of feasible, long-term SMS interventions

Appendix B

Theory of Planned Behaviour

Figure 2

Theory of Planned Behaviour (Ajzen, 1991)

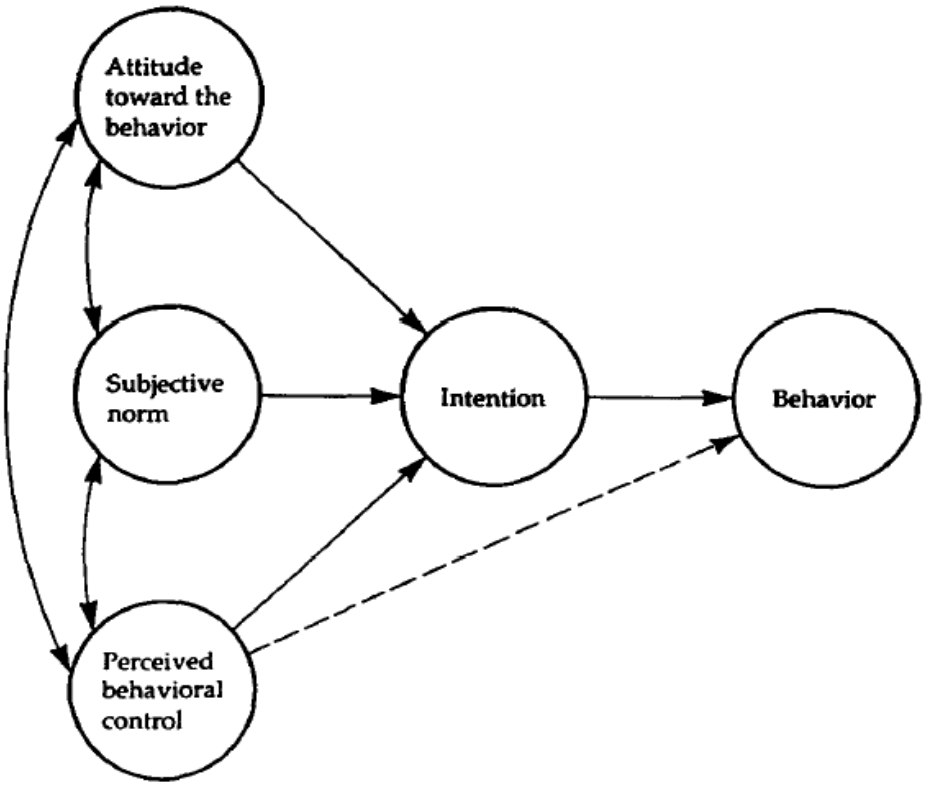

FIG. 1. Theory of planned behavior.

Appendix C

Ethics Approval

HiREB
Hamilton Integrated Research Ethics Board

December 21 2017

Project Number: 4189

Project Title: Exploration of Diabetes Coaching Experience among Community-Based Adults with Type 2 Diabetes Mellitus: An Interpretive Description

Student Principal Investigator: Miss Tharshika Sugumaran

Local Principal Investigator: Dr Diana Sherifali

We have completed our review of your study and are please to issue our final approval. You may now begin your study.

The following documents have been approved on both ethical and scientific grounds:

Document Name	Document Date	Document Version
Background Form_Tharshika Sugumaran (Nov 17)	Nov-17-2017	1
MScN Thesis Study Budget (Nov 17)	Nov-17-2017	1
Revised Consent Form_Experience of Diabetes Coaching_ Tharshika Sugumaran (Dec 12)_ CLEAN	Dec-12-2017	2
Revised Diabetes Coaching Protocol_ Tharshika Sugumaran (Dec 12)_CLEAN	Dec-12-2017	2
Telephone Script for Recruitment_ Tharshika Sugumaran (Nov 17)	Nov-17-2017	1

Any changes to this study must be submitted with an Amendment Request Form before they can be implemented.

This approval is effective for 12 months from the date of this letter. Upon completion of your study please submit a **Study Completion Form**.
If you require more time to complete your study, you must request an extension in writing before this approval expires. Please submit an **Annual Review Form** with your request.

PLEASE QUOTE THE ABOVE REFERENCED PROJECT NUMBER ON ALL FUTURE CORRESPONDENCE

Good luck with your research,

Kristina Trim, PhD, RSW
Chair, HiREB Student Research Committee
McMaster University

The Hamilton Integrated Research Ethics Board (HiREB) represents the institutions of Hamilton Health Sciences, St. Joseph's Healthcare Hamilton, and the Faculty of Health Sciences at McMaster University and operates in compliance with and is constituted in accordance with the requirements of: The Tri-Council Policy Statement on Ethical Conduct of Research Involving Humans; The International Conference on Harmonization of Good Clinical Practices; Part C Division 5 of the Food and Drug Regulations of Health Canada, and the provisions of the Ontario Personal Health Information Protection Act 2004 and its applicable Regulations; for studies conducted at St. Joseph's Healthcare Hamilton, HIREB complies with the health ethics guide of the Catholic Alliance of Canada

Appendix D

Telephone Script for Recruitment

Hello, my name is Tharshika Sugumaran and I am a Masters of Science in Nursing student at McMaster University. I received your contact information from a Research Assistant with the Diabetes Coaching Trial you recently participated in at your Community Health Centre. I am calling because you expressed initial interest in participating in a subsequent study regarding your experience with the diabetes coaching you received during the trial.

Are you interested in hearing more about the study?

I am trying to understand the experience of adults with Type 2 diabetes living in the community who recently received diabetes coaching. I want to better understand the possible challenges and benefits of diabetes coaching, how it may have or not helped with your management of Type 2 diabetes and overall, gain insight into your experience. This information could help us better understand how the diabetes coaching program is working and what can be done to improve it in supporting those with Type 2 diabetes.

Participation is voluntary and you would be required to complete a phone interview with myself, the student researcher, for approximately one hour. I will schedule the interview for a time that is convenient for you and provide you with a call at the arranged time. As a token of our appreciation and compensation for your time, you will receive a President's choice $20 gift card. Further, if you are interested, a summary of the findings may be e-mailed to you at the end of our study.

Would you be interested in participating in this study?

If yes, what days and times would be best for you to have a telephone interview? I can also provide more information about the study and answer any questions and/or concerns that you may have. If you need more time to think about your participation, then you may contact me at a later time by either email or telephone.

If no, thank you for your time.

My telephone number is:

My email address is:

Thank you.

Appendix E

LETTER OF INFORMATION / CONSENT

Experience of Diabetes Coaching

Investigators:

Local Principal Investigator:
Dr. Diana Sherifali
School of Nursing
McMaster University
Hamilton, ON, Canada
(905) 525-9140 ext. 21435
E-mail: dsherif@mcmaster.ca

Student Investigator:
Tharshika Sugumaran RN
School of Nursing
McMaster University
Hamilton, ON, Canada
905 541 6173
E-mail: sugumat@mcmaster.ca

What am I trying to discover?

As a part of my Masters of Science in Nursing degree, I am conducting a research study on the experience of diabetes coaching. I am interested in exploring the experience of adults with Type 2 diabetes living in the community who have recently received diabetes coaching at your local Community Health Centre. I would like to interview anyone who has recently participated in the larger trial and received diabetes coaching to gain insight into your experiences.

If you are interested, you are invited to take part in this subsequent study exploring the experience of diabetes coaching. I am trying to learn about the benefits and challenges you may have experienced, if you found it helpful or not and how it may be improved for others in the future.

What will happen during the study?

If you are interested, with your permission, I will first collect background information from you to gather some general background information. Secondly, you will take part in a one hour-long interview over the phone with myself, the researcher. The interview will consist of various questions regarding your experience with receiving diabetes coaching. Some of the questions include:

1. *What does managing Type 2 diabetes feel like for you (and or your family)?*
2. *What do you find the most challenging about living with Type 2 diabetes?*

3. *What specifically did you find the most challenging or beneficial about remaining in the earlier study?*
4. *Please describe your experiences with the diabetic health coach from your earlier involvement in the clinical trial? What did you like or enjoy? What did you dislike?*
5. *What was most beneficial experience with the coach and the approach and why? What was least beneficial and why?*

We can arrange for the phone interview based on a date and time that works with your schedule. The interview will be audio-recorded so that the responses you provide can be further analyzed and made sense of. The audio-recordings will be safely protected with secure passwords on a laptop where only the researcher will have access. These recordings will be transcribed word for word. The scripts will be analyzed by the researcher and three other faculty members who are on the research team.

You have the right and are free to stop the interview at any given point and withdraw from the study if you choose to at a later time. Furthermore, you are not obligated to share any information you feel is too personal or that you feel uncomfortable sharing.

Are there any risks to doing this study?

There are minimal risks involved in participating in this study. The topic of the interview pertains to discussions around your personal health and experience of managing Type 2 diabetes including challenges related to the disease as well as, other coinciding personal challenges. As a result, you may recall some difficult emotional events, which you may decide to share at your own discretion. If you do identify a need for any additional support or recourses, I will seek to locate and refer you where appropriate.

Are there any benefits to doing this study?

I hope that this study will help us understand more about the diabetes coaching program and how it may be improved to better meet the needs of adults managing Type 2 diabetes within the community. I hope this study is able to further our insight into the experience and challenges associated with managing Type 2 diabetes in the community and how diabetes coaching can be used to improve the care for these individuals. Furthermore, it is my hope that some participants from the larger trial would like to share their experience as an opportunity to reflect and provide their own feedback regarding the diabetes coaching they received.

Payment or Reimbursement

To compensate for your time, you will receive a 20 dollar President's choice gift card.

Who will know what I said or did in the study?

All audio recordings, transcripts and notes will be kept safe and secure to protect your privacy. They will be saved on only the researcher's password protected laptop within an encrypted folder and original recordings will be deleted. All printed documents including signed consents will be stored in a locked cabinet in the supervisor's office at McMaster

University. All efforts will be made to protect both your confidentiality and privacy. Any personal contact and identifying information you provide will be destroyed immediately following the completion of the study. You will be assigned a participant ID code, which will be used in replacement of your name. Further, any personal identifying information will not be included in transcripts or final write-ups of findings. Transcripts and data without anything identifying may be kept for up to 7 years after the study ends. The final write-up of findings will be published and presented as part of the researcher's thesis work and will be accessible to the public.
It is important to note however, that you may be identifiable to some depending on a particular story you choose to share so please be mindful during your interview. Your participation in the study will remain anonymous to everyone aside from members of the research team including myself.

b) Legally Required Disclosure

If legal authorities request the information you have provided, I may be required to reveal it.

What if I change my mind about being in the study?

Your participation in this study is voluntary. If you decide to be part of the study, you can stop and withdraw from the interview for any reason and at any given time, even after signing the consent form.If you decide to withdraw, there will be no consequences to you. In cases of withdrawal, any data you have provided up until this point will be destroyed if you should request to have it removed. If you do not want to answer some of the questions you do not have to, but you can still be in the study. If you choose to withdraw from the study after the interview has been completed at a later time, you may request to have any data your provided removed from the study until approximately May 2018.

How do I find out what was learned in this study?

I expect to have this study completed by approximately August 2018. If you would like a brief summary of the results, please let me know how you would like it sent to you.

Questions about the Study

If you have questions or need more information about the study itself, please contact me at:

sugumat@mcmaster.ca
905-541-6173

This study has been reviewed by the Hamilton Integrated Research Ethics Board (HiREB). The HiREB is responsible for ensuring that participants are informed of the risks associated with the research, and that participants are free to decide if participation is right for them. If you have any questions about your rights as a research participant, please call the Office of the Chair, HiREB, at 905.521.2100 x 42013.

CONSENT

I have read the information presented in the information letter about a study being conducted by Tharshika Sugumaran of McMaster University.

I have had the opportunity to ask questions about my involvement in this study and to receive additional details I requested.

I understand that if I agree to participate in this study, I may withdraw from the study at any time. I have been given a signed copy of this form. I agree to participate in the study.

I would like to receive a summary of the study's results.
Yes *No*

If yes, where would you like the results sent:

Email: _____

Mailing address: _____

_____

Consent form explained over telephone by:

_____	_____	_____
Name and Role (Printed)	Signature	Date

Verbal consent obtained from:

_____	_____
Name of Participant (Printed)	Date

The following to be completed over e-mail with electronic signature and emailed back to dsherif@mcmaster.ca for paper documentation.

_____	_____	_____
Name of Participant (Printed)	Signature	Date

If you do not have access to a computer and Internet service, a mailing address is required below so that a printed copy of this consent along with a pre-stamped envelope can be mailed to you. You are required to please have a review and sign the consent form, and mail it back to us at your earliest convenience.

Mailing address: _____

_____

Appendix F

Interview Guide Telephone Script

Hello, *(participant name)*. My name is Tharshika Sugumaran and I am a graduate student researcher with McMaster University.

Thank you for taking the time to talk to me. Today I will ask you some questions about your experience of receiving diabetes coaching at your Community Health Centre. The purpose of this interview is to help me understand your needs of managing Type 2 diabetes and how diabetes coaching was able to help or not with this. I would like to better understand some of the benefits and challenges with diabetes coaching to see how it may be improved for others in the future. The interview will take about one hour to complete and will be audio recorded. Anything you say will be confidential. Do you still consent to participating in my study?

(If participant responds "yes" the interview will continue.)

I would like to remind you that if at any point during the interview you feel uncomfortable with continuing then you may stop and withdraw your consent. You also have the right to withdraw your consent to participate in the study at any time later on. You are not obligated to share any information you do not wish to share and may choose to skip a question if you would like.

I would like to start with some basic background questions (will be collected on form)

Now, to proceed with the interview

1. *What does managing Type 2 diabetes feel like for you (and or your family)?*

2. *What do you find the most challenging about living with Type 2 diabetes?*

Now, I want to ask you some questions about your experience of receiving diabetes coaching over the last few months?

3. *Please describe your experiences with the diabetic health coach from your earlier involvement in the clinical trial? What did you like or enjoy? What did you dislike?*

4. *What was most beneficial experience with the coach and the approach and why? What was least beneficial and why?*

5. *What specifically did you find the most challenging or beneficial about remaining in the earlier study?*

   I would like to take a moment to just summarize key points you have provided at this time. Please feel free to add or clarify anything that I may have missed or misinterpreted.

   Are you okay to continue at this time?

6. *How important was diabetes self-management before receiving diabetes coaching and has this changed for you?*
   - *Did you want to make changes before coaching and why?*

7. *How did the diabetes coach make you feel about your diabetes self- management?*
   - *What did the diabetes coach do to help you gain more self-mastery over your diabetes?*

8. *What were your initial goals before participating in the diabetes coaching trial and do you feel like you met them? Why or why not? Please explain in detail if you can.*
   - *If you met them, are you still meeting this goal now that coaching is over?*

9. *Would you choose to receive diabetes coaching in the future and would you recommend this type of approach to others in order to gain more self-mastery over your diabetes?*
   - *Who do you feel would most likely benefit from diabetes coaching? Who do you feel this is not suitable for?*

10. *If you were to receive diabetes coaching again, is there anything else you would like to receive or experience? What recommendations would you be willing to provide to improve your experience or make it even better than it may have been.*

11. *Finally, let me summarize the key points that you have provided to me? Please add or clarify if I have missed anything or misinterpreted anything.*

To wrap-up, I would like to thank you again for your time today and sharing your experiences with me. We hope that through this study we are able to get a better understanding of the experience of diabetes coaching for those of you managing Type 2 diabetes and how it can be improved in the future. To thank you for participating in our study, I would like to give you a $20.00 President's choice gift card.

Would you be interested in receiving this gift card as a token of our appreciation?

If no, that is not a problem and I would again like to thank you for your time and participation in our study.

If yes, I will need you to provide me with a mailing address so that I am able to send this to you from our McMaster office.

Participant ID:
Mailing address: _____

_____

Appendix G
Background Form

Participant ID:_____
Date of interview: _____

1. Age: _____ years old
2. Sex: ☐Male ☐ Female
3. Are you currently employed? What is your occupation? How many hours a week do you work?
4. What is the highest level of education you have completed:
   - ☐ Elementary school
   - ☐ High school diploma
   - ☐ College degree
   - ☐ University degree
   - ☐ Graduate degree
   - ☐ Doctorate degree
5. How long have you had Type 2 diabetes?
6. Are you currently taking medications for your Type 2 diabetes?
   - ☐ Oral medications
   - ☐ Insulin
   - ☐ Both
   - ☐ Other (GLP1 is an injectable but not insulin)
7. What was your baseline A1C when beginning the study? Did this improve?
8. Are you married? If so, does your spouse provide any support with your diabetes management?
9. Are you a parent? How many children do you have?
10. Is there anyone else in your home that provides support with your diabetes management?
11. Were you also receiving any other form of diabetes management support?
    - ☐ Diabetes education
    - ☐ Diabetes community support group
    - ☐ Fitness/ nutritional program
    - ☐ Other (please specify)
12. Are you currently also managing any other chronic conditions simultaneously?
    - ☐ Yes (please specify) No

Appendix H

Participant Demographics

Table 3: Participant Demographics (N=12)

Variable	Subcategory	n	%	Mean (SD)
Sex	Male	4	33.3	
	Female	8	66.7	
Age				62.0 (6.91)
	36-45	0	0	
	46-55	1	8.3	
	56-65	6	50.0	
	66-75	5	41.7	
	75+	0	0	
Marital Status	Married	8	66.7	
	Common-law	0	0	
	Divorced/Separated	3	25.0	
	Single	1	8.3	
No. of Children				2.50 (4.12)
Education	Some High school	2	16.7	
	Completed Secondary	2	16.7	
	Completed Post-Secondary	8	66.7	
	Completed Graduate Studies	0	0	
Employment	Full-time	4	33.3	
	Part-time	3	25.0	
	Unemployed	0	0	
	Retired	5	41.7	
Years Diagnosed				15.89 (9.82)
Medication	Insulin	2	16.7	
	Oral	4	33.3	
CHC	Both	6	50.0	
	Attended	8	66.7	
	Did Not Attend	2	33.3	
Family Support	Support	6	50.0	
	Unsupported	6	50.0	