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# A Study Of Certified Diabetes Educators: A Descriptive Exploration Of The Delivery Of Diabetes Self Management Support In Community Based Settings In Ontartio

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**A STUDY OF CERTIFIED DIABETES EDUCATORS: A DESCRIPTIVE  
EXPLORATION OF THE DELIVERY OF DIABETES SELF MANAGEMENT  
SUPPORT IN COMMUNITY BASED SETTINGS IN ONTARIO**

by

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Bachelor of Science in Nursing,

McMaster University, Hamilton, Ontario, 2008

A thesis

presented to Ryerson University

in partial fulfillment of the  
requirements for the degree of

Master of Nursing

in the Program of

Nursing

Toronto, Ontario, Canada, 2012

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**A STUDY OF CERTIFIED DIABETES EDUCATORS: A DESCRIPTIVE  
EXPLORATION OF THE DELIVERY OF DIABETES SELF MANAGEMENT  
SUPPORT IN COMMUNITY BASED SETTINGS IN ONTARIO**

Master of Nursing, 2012

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Master of Nursing Program

Ryerson University

**Abstract**

There has been a recent shift in diabetes care from hospitals to community settings. This exploratory descriptive study used a convenience sample (n=33) recruited from the Canadian Diabetes Association Educator Sections, in Ontario, to examine the extent to which certified diabetes educators (CDEs) perceive the delivery of diabetes self management support (DSMS), in community settings and the supports and barriers that influence DSMS delivery. Overall, CDEs reported delivering DSMS at a level that reflected consistent implementation at the team level, but lacked system wide consistency. The patient support element most consistently delivered was patient involvement in decisions; the organizational element most frequently endorsed was multidisciplinary teams. Patient related factors were the most frequently reported barriers; the most frequently reported support was a multidisciplinary team approach. This is the first study to examine DSMS delivery in community settings, thus these findings serve as a baseline for future comparison.

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## **Dedication**

This thesis is dedicated to my amazing husband Craig. You have made this achievement possible through your unconditional love, support and encouragement. At times the finish line was far from sight but you were with me every step of the way, as my main supporter. I could not have done this without you, I love you!

## Table of Contents

Chapter 1: Background and Problem Statement	1
Background	1
Chronic Illness Care and the Ontario Diabetes Strategy	2
Diabetes Self Management Support	4
Barriers and Facilitators to DSMS	6
Problem Statement	9
Purpose	9
Research Questions	10
Significance	10
Chapter 2: Literature Review	12
Literature Search Strategy	12
Background of Diabetes Self Management Support	13
Setting of DSMS	14
Who delivers DSMS	14
Theoretical Literature	15
Patient self management	15
Dimensions of patient support	16
Individualized patient assessment	16
Goal setting	17
Action planning	18
Problem Solving	18

Follow-up	19
Dimensions of Organizational Support	20
Team based care	21
Continuity of care	21
Co-ordination of referrals	21
Systems to document diabetes self management interventions	22
Contributions from patients	23
Professional development	23
Summary	24
Empirical Literature Related to Factors Affecting DSMS Delivery	24
Delivery of self management support	24
Provider Factors: Barriers and Supports	27
Financial resources	27
Program resources	28
Resources to support teaching and learning	28
Inter-professional perspectives on self management support	29
Summary	31
Patient Factors: Barriers and Supports	32
Physical factors	32
Logistics	33
Support	34

Patients' perceptions about their vulnerability to diabetes and its consequences	34
Factors related to patient knowledge / understanding	36
Other	36
Gaps in the Literature	37
Summary	38
Chapter 3: Framework	39
Chronic Care Model	39
Background	39
The community	41
The health system	41
Delivery system design	41
Decision support	42
Clinical information systems	42
Self management support	42
Patient provider relationship	43
Study framework	43
Patient supports	43
Organizational supports	45
Summary	47
Chapter 4: Methods and Procedures	48
Design	48

Sample	48
Target & accessible population	48
Sampling method	50
Inclusion criteria	51
Sample size considerations	51
Setting	51
Ethical Considerations	52
Measurement Methods	54
Demographic information	54
Assessment of Primary Care Resources and Supports	54
Barriers and supports open ended questions	57
Procedures	57
Recruitment and data collection	57
Data Analysis	59
Missing data	59
Summary of missing data	60
Reliability testing	61
Approach to analysis	61
Description of sample	61
Research questions	62
Chapter 5: Findings	65
Sample	65

Response rate	65
Demographic profile	65
Findings Addressing Research Questions	67
Primary care resources and supports	67
Facilitators and barriers to DSMS	70
Supports - factors enhancing the delivery of DSMS	70
Barriers - factors inhibiting the delivery of DSMS	74
Chapter 6: Discussion	80
Introduction	80
Representativeness of the Sample	80
Discussion of Key Findings	81
Primary Care Resources and Supports Tool	81
Patient supports subscale	81
Individual patient support subscale item scores	84
Organizational Supports Subscale	86
Mean organizational subscale scores	86
Individual organizational support item scores	87
Supports - Factors Enhancing the Delivery of DSMS	88
Team based care	88
Individualizing DSMS	89
CDE knowledge / experience / credentials	90

Barriers - Factors inhibiting the Delivery of DSMS	91
Patient related factors	91
Physician related factors	92
Staffing and scheduling	93
Lack of funding	93
Lack of team commitment to self management	94
Outcomes focus versus self management focus	95
Summary	96
Chapter 7: Summary, Implications, Conclusions	97
Summary	97
Study Limitations	98
Sample	98
Setting of study completion	99
Implications	100
Implications for practice	100
Implications for service delivery	100
Implications for team based care	102
Implications for research	103
Implications for theory	104
Implications for policy	106
Conclusion	106

## List of Tables

Table 1. Mean Subscale Scores by Group	62
Table 2. Demographic Profile of Participants	67
Table 3. Descriptive Statistics for PCRS Subscales	68
Table 4. Descriptive Statistical Analysis of Individual Items on the Patient Support Subscale	69
Table 5. Descriptive Statistical Analysis of Individual Items on the Organizational Support Subscale	70
Table 6. Factors Enhancing the Delivery of DSMS	71
Table 7. Factors Inhibiting the Delivery of DSMS	75

## List of Appendices

Appendix A - Consent Information: Face to Face Version	108
Appendix B - Consent Information: Mailed Version	110
Appendix C - Demographic Information Questionnaire	112
Appendix D - Recruitment Email	113
Appendix E - Follow up Email for Chair Persons	114
Appendix F - Follow up Email for Individuals	115

## **Chapter 1: Background and Problem Statement**

### **Background**

Diabetes is currently being labeled a global pandemic (CDA, 2011) projected to affect 400 million persons worldwide by 2030 (CDA, 2011). It is estimated that more than 8 million Canadians have diabetes or pre-diabetes. Two and a half million people have been diagnosed with diabetes in Canada, a condition characterized by high blood sugar levels ( $> 7.0\text{mmol/L}$ ). Six million people in Canada have pre-diabetes, a condition known as a precursor to diabetes characterized by fasting blood sugars that are higher than normal ( $6.1\text{-}6.9\text{ mmol/L}$ ), but not yet high enough to be classified as diabetes (CDA, 2011).

The high incidence of diabetes has forced a shift in health care away from acute care to primary care settings. Specifically, the government of Ontario has dedicated funding to increase diabetes programs across the province offered in community care organizations such as family health teams. The model of diabetes care has also shifted away from traditional didactic education to client centered diabetes self management support. Diabetes self management support (DSMS) refers to a variety of interventions that certified diabetes educators (CDEs) use to assist patients with self management. The interventions include individualized patient assessments, education, goal setting, action planning, problem solving, and follow up (ICIC, 2006). The focus of this study is to explore the perceived ability of CDEs working in community settings to deliver DSMS, and the supports and barriers that enhance or impede its delivery in Ontario.

## **Chronic Illness Care and the Ontario Diabetes Strategy**

The increased incidence of chronic illness care such as diabetes, resulted in the shift of care from acute to community based settings. This shift necessitates new approaches to health care delivery. One approach to structuring chronic illness care is described in the Chronic Care Model (CCM) which was developed to guide the restructuring of health services to better deliver chronic illness care (ICIC, 2006). The CCM identifies and defines elements that are essential for the provision of chronic disease care. These elements include the community, the health system, self-management support, delivery system design, decision support and clinical information systems (ICIC, 2006). Whereas all of the elements of the CCM contribute to improved chronic illness care, the focus of the present study was self management support. Self management support is pivotal to engaging people with chronic illnesses, such as diabetes, in their care. The goal of self management support is to “empower and prepare the patient to manage their health and health care” (ICIC, 2006, Model Elements).

In 2007, The Ontario Ministry of Health and Long Term Care (MOHLTC) published *Preventing and Managing Chronic Disease: Ontario’s Framework* (MOHLTC, 2007). This framework was based on the CCM and has been used as a guide to improve chronic illness care and frame new initiatives in Ontario. The Chronic Disease Prevention and Management (CDPM) framework was developed in recognition that chronic illness is lifelong; requires the patient to be an active participant rather than a “passive recipient” (MOHLTC, 2007, p.7) of care; is multifaceted; requires collaboration among multi-disciplinary care team members; and warrants health promotion and disease prevention (MOHLTC, 2007). The framework was a response to alarming chronic disease statistics from 2003, where diabetes represented 9% of chronic diseases in Ontario, but was responsible for 32% of heart attacks, 43% of heart failures,

30% of strokes, 51% of new dialysis and 70% of amputations (CDA, 2011). The purpose of the Ontario CDPM framework was to respond to a growing epidemic of chronic diseases within the province and to establish a framework to guide chronic illness care improvements.

Not long after the publication of the Ontario CDPM in 2007, diabetes was targeted as a disease requiring province-wide intervention. In 2008, the MOHLTC unveiled a \$741 million “Diabetes Strategy” that included \$290 million dedicated to “increasing access to team based care closer to home by mapping the prevalence of diabetes across the province and the location of current diabetes programs in order to align services that address service gaps” (MOHLTC, 2010, Ontario’s Diabetes Strategy, p. 3). Funding was provided for 51 new diabetes care teams that are situated in a variety of community based settings including community health centers (CHC), family health teams (FHT), community organizations, aboriginal remote mobile services van that is, the Canadian National Institute for the Blind (CNIB) that services 30 remote northern communities, aboriginal community health centers, aboriginal health access centers, as well as a few hospital based settings in rural areas (MOHLTC, 2010). Funding for these programs included a registered nurse (RN) and a registered dietitian (RD) who work with family physicians and other diabetes related health care professionals such as chiropodists, physiotherapists and social workers in order to provide diabetes self management support (MOHLTC, 2010).

In Ontario, RNs and RDs working in diabetes programs are typically certified diabetes educators (CDEs). The term “certified diabetes educator”, in Canada, refers to a health care professional that is registered with a regulatory body, has completed 800 hours of working in a diabetes care setting within three years, and has successfully completed the exam set forth by the

Canadian Diabetes Educator Certification Board (CDECB) (CDECB, 2007). Within the context of this study, the term CDE will be used to refer to registered nurses (RNs) and/or registered dietitians (RDs) who have certified diabetes educator (CDE) status.

### **Diabetes Self Management Support**

In Ontario, CDEs are primarily responsible for the delivery of diabetes self management support (DSMS). DSMS is recommended as a valuable component of diabetes care (Canadian Diabetes Association [CDA], 2008) and is an integral component of the CCM. The term DSMS, as outlined in the Clinical Practice Guidelines for Diabetes Prevention and Management in Canada, is used rather than diabetes education to emphasize the importance of client centered strategies that address the physical, psychological and social aspects of living with diabetes (CDA, 2008). DSMS differs from traditional diabetes education as it focuses on problems identified by the patients rather than the providers; on problem solving skills rather than technical skills only; and on enhancing confidence in these skills rather than just instructing patients in these skills.

DSMS, as defined by the Canadian Diabetes Association (CDA), includes four components: skills training, coping strategies, problem solving and case management (CDA, 2008). Skills training refers to the physical skills needed to manage diabetes and may include blood glucose monitoring or insulin injecting. Coping strategies are taught and facilitated to assist patients in dealing with the emotional sequelae of a chronic condition. Problem solving skills are needed to address issues that may come up in the daily management of diabetes, such as how to adjust insulin dosages for exercise. Case management is a component implemented by healthcare professionals and includes the following tasks: following up with patients for an extended period of time, monitoring lab work, changing medications within medical directives

and consulting with the primary care physician as needed (CDA, 2008). The CCM provides a more comprehensive definition of DSMS encompassing a variety of interventions used to support patient self management, which include, in addition to education, individualized patient assessments, goal setting, action planning, problem solving, and follow up (ICIC, 2006). Thus, DSMS primarily relies on patients and diabetes educators to define management issues, set priorities, establish collaborative goals, identify barriers, create a management plan, and problem-solve to maintain optimal management (Von Korff, Gruman, Schaefer, Curry, & Wagner, 1997).

DSMS aims to achieve optimal health status, improve quality of life, and reduce the need for costly health care. Results of studies suggest that people receiving DSMS, compared to people who do not, show improved clinical outcomes such as improved diabetic control, psychosocial function, ability to engage in self care, and enhanced quality of life (Chodosh, et al., 2005; Norris, Engelgau, & Narayan, 2001;). It is also well documented that DSMS is effective in improving self-care behaviors, glycemic control, lipid profiles, and blood pressure (Norris et al., 2002), all of which reduce both the risk and the progression of diabetes complications (Skyler, 2004), resulting in improved quality of life (Ellis et al., 2004) and lower health care costs (Robins, Thatcher, Webb & Valdmanis, 2008). These findings highlight the benefits of DSMS on a number of patients' and health care system outcomes. Therefore, there is a need to explore how DSMS is being implemented in Ontario in order to understand its contribution to these beneficial outcomes.

DSMS is a complex health intervention that is aimed at improving diabetes care and patient outcomes. Diabetes has been highlighted as a priority for Ontario as reflected in the

Diabetes Strategy. Two frameworks, the CCM and the Ontario CDPM framework, have highlighted the importance of SMS for patients with chronic diseases. Given that diabetes is a growing epidemic, the Ontario Diabetes Strategy initiative aimed to increase the number of RNs and RDs in community settings to respond to the need for DSMS. Therefore, examining how diabetes care, specifically DSMS, is being delivered in these settings is timely. Examining the delivery of DSMS will give insight into the dimensions of DSMS that are well implemented, and those that are not. Findings of this exploration may uncover gaps in the delivery of DSMS, or gaps in the organizational infrastructure to support DSMS delivery, which may affect achievement of desired outcomes. To date, there is limited research that has examined the delivery of DSMS in community settings. However, available findings suggest there are barriers that inhibit the delivery of DSMS in settings other than the community. This study is the first known to explore the delivery of DSMS in community settings in Ontario from CDE's perspectives, and examine the supports and barriers to the implementation of DSMS that are present in the community.

### **Barriers and Facilitators to DSMS**

Whereas the literature has not specifically focused on the delivery of DSMS in community settings, limited evidence from other settings suggests factors that may enhance or inhibit its delivery. Brownson et al. (2007) state that self management support (SMS) has shown itself to be more challenging to implement than other “structural” aspects of chronic illness care such as clinical information systems, but the reason for this challenge remains unclear. However some studies have examined the barriers and facilitators faced by *patients* in utilizing DSMS. Siminerio, Piatt and Zgibor (2005) qualitatively assessed physician's perspectives on *patients'* barriers to participating in DSMS in rural primary care settings. Four main themes emerged:

lack of patient knowledge, co-morbid conditions, accessibility issues and personal health beliefs. Lack of knowledge was related to patient's understanding of diabetes as well as patient's awareness of existing diabetes support services. Co-morbid conditions were experienced by many people with diabetes and were reported to affect their participation in DSMS, but exactly how the co-morbid condition was a barrier was not clarified. Accessibility issues included physical access to diabetes support services, the physical effects of diabetes, discomfort associated with the treatment, and limited range of available services; as well as personal accessibility issues such as finances and problems with the physician's appointment systems. The final barrier was related to personal health beliefs and included patients' confidence in their ability and their motivation to take on diabetes self care behaviors (such as exercise, or blood glucose monitoring).

Other studies examined patients' perspectives of barriers to participating in DSMS. Results of these studies identified the following barriers: patient frustration with disease progression, lack of glycemic control (Nagelkerk, Reick & Meengs, 2006; Sprauge et al., 1999), and lack of family support (Sprauge et al., 1999). Given that DSMS requires active patient engagement, barriers experienced by patients may provide some insight into challenges that CDEs may face in delivering DSMS.

Limited empirical literature exists regarding the challenges faced by diabetes educators in implementing DSMS. Preliminary studies in the United States have identified a few key issues related to barriers to delivering DSMS, yet they have not been studied especially in Canada, or understood extensively. The factors, as identified in US based studies, can be categorized into those pertaining to administration, communication, education, and follow up. Administrative factors that acted as barriers to DSMS were unclear guidelines for the referral process (Peyrot et

al., 2009), lack of clerical or administrative support (Peyrot et al., 2009), and lack of internal resources including funding, staffing and materials (Sprauge et al., 1999). Communication issues included problems in the exchange of information about the patient's condition between the physician and the educator (Peyrot et al., 2009). CDEs' education was a factor that affected the delivery of DSMS. CDEs did not always have opportunities for continued professional development and for acquiring new knowledge and skills relating to their roles as CDEs (Funnell et al., 2006; Sen, 2005). The last challenge was follow up, that is, patients were not following up with their physician (to obtain requisitions for blood work, changes in medication dosages, renewed prescriptions) and physicians were not regularly ordering metabolic measurements based on the clinical practice guidelines, or patients were not following through on the metabolic measurements ordered by their physicians (i.e. glycosylated hemoglobin) (Sprauge et al., 1999).

Empirical evidence has provided a limited representation of CDE's perspectives on their ability to deliver various aspects of DSMS and on factors that affect their ability to implement DSMS. Of the few existing studies, none have focused on community settings exclusively. The current empirical evidence suggests some challenges, but offers no details on their nature and has not directly focused on describing what these challenges are. None of these studies have differentiated between CDEs working in community based care versus CDEs working in acute care settings. Because it has not been studied, it is unclear if CDEs in community settings have the same supportive resources for delivering DSMS to patients as those available in acute care. For example in community organizations, CDEs do not usually have access to endocrinologists, which they would have access to if they worked in what is known as "diabetes education centers" in hospitals. Therefore, further research is needed to uncover factors that may have potential to affect the delivery of DSMS in community settings.

The limited number of studies that have explored CDEs' perspectives have all been in an American context, which further underscores the need for Canadian research. Funnel et al.

(2006) articulate the current state of DSMS research in the United States:

It is clear from the scientific literature that there have been changes in the delivery of diabetes self management [support] and that these changes have had a positive influence on patient outcomes. What has been far less clear is how and why the educators delivering the [support] have changed the way they practice and the constraints and resources available to them (p. 368).

However, findings from American health care literature are not always applicable to a Canadian context because of differences in health care systems, thus underscoring the need for Canadian research regarding DSMS delivery.

### **Problem Statement**

DSMS is a multi-faceted, complex intervention that involves skills training, coping strategies, problem solving and case management. In Ontario, it is typically delivered by CDEs. Despite the fact that DSMS is a part of standard care, what remains unclear is how CDEs perceive their ability to deliver the various dimensions of DSMS and what factors contribute to their perceived ability to implement DSMS in community care settings. Facilitators and barriers to delivering DSMS in community settings are not well defined and lack empirical substantiation.

### **Purpose**

The overall purpose of this study was to examine the delivery of DSMS in community care settings from the perspective of CDEs. The specific aims were (1) to examine the extent to which CDEs working in the community setting report they are delivering the various aspects of DSMS; and (2) to explore CDEs' perception of the facilitators and barriers for DSMS delivery in community settings.

## **Research Questions**

The research questions the study addressed were:

1. To what extent do CDEs report they are delivering the various components of DSMS?
2. What factors do CDEs identify as facilitating or inhibiting the delivery of DSMS in community care settings?

## **Significance**

Diabetes is an epidemic in Canada, and particularly in Ontario. Given the nature of diabetes as a chronic condition, it is impossible to manage the disease using an acute care model in acute care settings alone. Thus, the CCM and the Ontario CDPM framework have been used to guide the transformation of diabetes care. These frameworks highlight the importance of SMS to improve outcomes for people living with chronic conditions. The province of Ontario has targeted diabetes as a condition that requires more resources aimed at improving diabetes services in the community. As a result, the government has dedicated funding to increase the numbers of RN and RDs, most of whom are CDEs, to deliver SMS in community based settings, such as family health teams and community health centers. However, as these initiatives are new in the context of diabetes care in Ontario, it is increasingly important to study how DSMS is being delivered.

DSMS is a complex set of health interventions that has not been well explored from the perspective of CDEs. Studies have suggested that there are barriers and supports to the delivery of DSMS, yet these factors have not been studied exclusively in community settings or in Canada. Identification of barriers and supports provides a deeper understanding of DSMS

delivery and points to areas to be revised to facilitate the implementation of DSMS. Since the role of the CDE is to deliver DSMS, it is imperative that their perspectives be well represented.

## **Chapter 2 Literature Review**

A literature review was conducted to gather information on the delivery of diabetes self management support (DSMS). The literature pertains to the implementation of DSMS in multiple settings due to limited literature about DSMS in community settings alone. The literature review was also done to identify factors that enhance or inhibit the perceived ability of CDEs to deliver DSMS, including factors identified by CDEs and patients.

Following a description of the search strategy, this chapter provides a background about diabetes self management support (DSMS) and terms that demonstrate how DSMS has evolved. Next, theoretical and empirical literature that examines DSMS is summarized. The definition of DSMS, derived from the Chronic Care Model (CCM) is presented. Finally, factors affecting the delivery of DSMS are identified.

### **Literature Search Strategy**

The search strategy involved an iterative process that began by searching the following databases: Ovid Medline, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Proquest Nursing Journals, and Cochrane Central Register of Controlled Trials. Individual journals were also searched: Diabetes Educator and the Journal of Advanced Nursing. The keywords used in the searches were a combination of the following: self management education, self management support, diabetes, primary care, community, and the Chronic Care Model (CCM). The following limits were applied: linked full text and English language.

The Health and Psychosocial Instruments (HAPI) database was searched to find instruments that operationalize the domains of DSMS in the Chronic Care Model, or the factors

that support the delivery of DSMS. One such instrument, the Primary Care Resources and Supports Tool (PCRS) (Diabetes Initiative, 2006) was located through HAPI.

Due to difficulty in locating literature that was directly related to the study topic, reference lists of articles included in the review were also searched for potentially relevant empirical literature. The bibliography of the Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada (2008) was also used as a source to identify further studies.

Articles were selected if they focused on 1) diabetes self management support or the use and access to diabetes services; 2) the perspectives of patients accessing DSMS, or providers (nurses, dietitians, CDEs, physicians) that delivered DSMS; 3) self management support as an element of CCM. Due to difficulty locating articles that focused on community settings alone, other settings (i.e. hospital) were included. A total of 22 articles were included in the review.

### **Background of Diabetes Self Management Support**

In this section the evolution of DSMS is briefly described to clarify the features of DSMS that distinguish it from “diabetes education”. Self management was a concept first used in 1960’s within the context of children who were chronically ill with asthma (Lorig & Holman, 2003). The use of this term was used to denote that patients were active participants in their health and health care in a variety of chronic conditions. Various terms such as self management, patient education or self management education, and self management support are commonly used in diabetes literature and are often used interchangeably (Glasgow, Davis, Funnell, Beck, 2003). However, these terms refer to different ideas. Self management is used to describe individual patients’ ability to “manage the symptoms, treatment, physical and psychosocial consequences and lifestyle changes” (Glasgow et al., 2003, p. 563) that come with a chronic

disease. Patient education, or self management education, is an intervention delivered by health care providers; traditionally it involves didactic and prescriptive education that is based on the providers' perspective of how a patient should manage diabetes (Glasgow et al., 2003). Patient self management education (SME) has evolved into what is now known as self management support (SMS) which includes a variety of interventions, not just education, to support patient self management. These interventions include individualized patient assessments, goal setting, action planning, problem solving, and follow up (ICIC, 2006).

### **Setting of DSMS.**

Historically, CDE's worked in hospital based settings, serving both inpatients and outpatients. They typically worked in a diabetes clinic that also employed endocrinologists. DSMS is also now provided in community settings where not all resources may be available. CDEs in hospital based settings have access to resources that CDEs in community settings do not, such as endocrinologists. Because of the shift in practice setting, it is important to align new research studies with the new practice settings with the purpose of identifying how DSMS is being delivered and the factors impacting the delivery of DSMS in community settings.

### **Who delivers DSMS.**

In Canada, and specifically in Ontario, the health care providers predominantly responsible for the delivery of DSMS are CDEs. There are approximately 1,200 CDEs in Ontario alone according to the Canadian Diabetes Educator Certification Board (J. Currie, personal communication, December 2, 2010). CDEs must be registered with a regulatory body in Canada as health professionals, with a minimum of 800 hours of diabetes education and must pass a certification exam (Canadian Diabetes Educator Certification Board (CDECB), 2007).

Typically in diabetes education programs, CDEs are registered nurses (RN) or registered dietitians (RD), as seen in the Ontario Diabetes Strategy which has funded new teams consisting of an RN and an RD.

## **Theoretical Literature**

### **Patient self management.**

Whereas DSMS refers to strategies that diabetes educators use to support patients living with diabetes, diabetes self management reflects the notion that persons living with diabetes must “self manage” the condition. Therefore, in order to understand the CDE’s role in DSMS it is necessary to understand what self management entails from the patient’s perspective. Corbin and Strauss (1988) as cited in Lorig and Holman (2003) conceptualized the tasks of patient self management into three broad areas based on a qualitative study of people living with chronic conditions: 1) medical management, 2) role management and 3) emotional management.

Medical management of diabetes includes following medication regimes, or monitoring blood glucose. Role management entails “maintaining, changing, and creating new meaningful behaviors or life roles” (Lorig & Holman, 2003, p. 1). It is concerned with the adaptations of a person’s social role such as caring for children and working within the context of their health.

Emotional management deals with the emotional “sequelae” of the condition which can alter a person’s view of their future (Lorig & Holman, 2003). Depression and emotions such fear and anger are higher in people living with diabetes than the general population (CDA, 2012, Diabetes and Depression; Lorig & Holman, 2003). Therefore, it becomes important for people with a chronic disease to manage the emotional responses to their disease. Lorig and Holman (2003) propose programs that address the three areas (i.e., medical, role and emotional management) to

enhance patients' self-management. The extent to which CDEs are able to deliver DSMS that inherently addresses medical, role and emotional management of diabetes was examined in this study.

### **Dimensions of patient support.**

Diabetes self management support refers to a variety of interventions used by the CDE to facilitate patient self management in the areas of medical, role and emotional management of diabetes. In DSMS, "clinicians [CDEs] are responsible for providing information, evidence based care, and support but they are not responsible for guaranteeing that patients carry out a prescribed set of activities" (Glasgow et al., 2003, p. 565). The Chronic Care Model outlines five strategies for implementation of DSMS: individualized patient assessments, goal setting, action planning, problem solving, and follow up (ICIC, 2006).

### ***Individualized patient assessment.***

CDEs conduct individualized assessments of the patient's current knowledge level, emotional health, social support, and clinical status. Assessment of patient's knowledge level includes consideration of learning ability (level of understanding, health literacy and numeracy), ability to change, resources available (financial resources for prescriptions) and patient motivation for self care behaviors such as blood glucose monitoring (CDA, 2008, Self Management Education, Glasgow et al., 2003). Assessing patients' knowledge is an essential step in determining how much a patient knows about the management of diabetes and facilitating the selection of relevant support strategies.

Emotional health is an important aspect of patient assessment, as rates of depression have been shown to be higher in people with diabetes, compared to people without diabetes (Anderson

et al., 2001). During emotional health assessment it is important to assess the availability of the patient's social support network, which may help to foster emotional health. Emotional health assessment therefore includes the assessment of social support as defined by "the assistance or help that is accessible to a patient through their social ties to others including family, friends, neighbors and peers" (Diabetes Initiative, 2006, p.9). Social support can take many forms such as "emotional support, tangible assistance, information or helpful feedback" (Diabetes Initiative, 2006, p.9).

Assessment of a patient's clinical status encompasses a variety of clinical parameters, primarily glycosylated hemoglobin (hemoglobin A1C) which is a measure of glycemic control. Assessment of glycemic control is done to guide the selection and provision of supportive interventions that are responsive to patients' status.

### ***Goal setting.***

Goal setting involves the identification of a target that the patient wishes to achieve, such as a health behavior, or application of a treatment recommendation and developing a plan to achieve it (Diabetes Initiative, 2006). Well articulated goals are "SMART" - specific, measurable, action-oriented, realistic and time limited" (Diabetes Initiative, 2006, p.9). The CDE assists the patient to set a plan that follows "SMART" guidelines. One quantitative study examined the effect of goal setting on glycemic control (Naik et al., 2011). Participants were randomized to the comparison or intervention group. The intervention was a clinician-led, patient centered series of 4 sessions on self management action plans and communicating progress toward achievement of the action plans with the group. Results showed that participants in the intervention group had significantly greater improvements in glycosylated

hemoglobin (8.8% - 8.0%) following the intervention than the control group (8.74% - 8.70%) (Naik et al., 2011). These findings suggest that goal setting may help to improve glycemic control. Providing self management support through goal setting may in fact address the medical, emotional or role management of diabetes, depending on the patient goal. For example, a patient may set a goal related to the medical management of diabetes, such as attempting to take medications with greater consistency; or a goal related to the emotional management of diabetes might be to find a diabetes support group and attend weekly meetings.

### ***Action planning.***

Action planning entails the articulation of strategies that patients can apply to achieve the goal they have set. Planned actions are important in chronic disease self management as patients often have to make many lifestyle changes. Specifically mapping out a planned change and determining importance and confidence levels for that change are key elements of making change sustainable (Lorig & Holman, 2003). Action planning involves taking steps to acquire knowledge and skills that foster behavior change (Lorig & Holman, 2003). Glasgow et al. (2003) articulate five clear steps that CDE's can follow to assist patients in making their action plan. The five steps are: assess, advise, agree, assist, and arrange (Glasgow et. al, 2003).

### ***Problem solving.***

Problem solving includes identifying problems or barriers to the application of self management, examining possible solutions to the problems or strategies to address the barriers, choosing one solution to implement, evaluating the effectiveness of that strategy, and making a plan for next steps (Diabetes Initiative, 2006). Problem solving is one part of DSMS and requires collaboration between the CDE and the patient. Glasgow et al. (2003) re-iterate that it is

important for the CDE to adopt a problem solving approach and that this approach be linked to the patient's identified barriers to self management. It has been highlighted that patients and health care providers often differ in their perspective of what constitutes a problem. A patient problem is one that is personally relevant, or has immediate consequences (Mulvaney, 2009). As Mulvaney (2009) explains, low self management is typically indicative of an imbalance between self management barriers and coping skills / problem solving strategies. Problem solving is based on the premise that self management is problem based (Lorig & Holman, 2003). The patient presents a particular problem and the clinician provides self management support by helping the patient work through the problem solving steps. Mulvaney (2009) outlines the steps to problem solving aimed at reducing barriers to diabetes self management as follows: 1) identify the problem, the barriers to self management, potential solutions to the problem, 2) articulate a plan to implement a solution, 3) implement the solution, and 4) evaluate the solution.

### ***Follow-up.***

Regular follow up appointments with patients are an important part of DSMS. Follow-up can be achieved in a variety of ways, such as scheduled face to face visits, telephone calls, or electronic mail. Von Korff et al. (1997) outline the important tasks that can be achieved by regular follow up: obtain information about functional and health status, identify potential complications, check progress in implementing planned goals, make modifications to the current plan of action, and reinforce the patient's achievements.

In summary, the CCM outlines five strategies to provide DSMS that include assessment, goal setting, action planning, problem solving, and follow-up. The five strategies address the three areas of diabetes self-management. This study examined the extent to which CDEs report

DSMS, as operationalized in the five strategies is being delivered in community settings. Factors within organizations that can influence CDE's implementation of diabetes self management for patients are identified in the next section.

### **Dimensions of organizational support.**

The theoretical literature discussed above has focused on how DSMS should be delivered by CDEs to patients in primary care settings. This section discusses the organizational factors within the system (i.e., health care organization) that may affect the extent to which CDEs provide DSMS. DSMS encompasses actions taken by the health care provider to provide patient support for DSM. Organizational support refers to factors that may affect the delivery of DSMS.

The Diabetes Initiative of the Robert Wood Johnson Foundation, founded in 2002, focused on developing a program called Advancing Diabetes Self Management (ADSM) to develop a model for DSMS in primary care settings (Shetty & Brownson, 2007). Through the Diabetes Initiative and consultation with field experts, resources and supports for self management for chronic conditions in primary care were identified, and were dichotomized into organizational and patient support categories (Shetty & Brownson, 2007). Shetty and Brownson's (2007) work focused on identifying organizational factors that need to be in place in order for the health care provider [such as CDE] to deliver self management support. The organizational factors identified in Shetty and Brownson's (2007) work were based on the experiences of primary care teams involved in the Diabetes Initiatives. Eight factors were reported:

- 1) team based care, 2) continuity of care, 3) co-ordination of the referral process, 4) systems to document the diabetes self management intervention, 5) continued quality improvement, 6) contributions from patients, 7) professional development opportunities

for staff and 8) the integration of these self management support factors into primary care settings (Shetty & Brownson, 2007, p.186).

### ***Team based care.***

Shetty and Brownson (2007) describe a patient care team as a group of health care providers, which may include physicians, nurses, diabetes educators, dietitians, or others, who work together to optimize patient care. They describe effective, high functioning teams as those who have clearly defined roles, are cross trained (i.e. have the same knowledge and skills), have regular case meetings, and embrace the team approach to care (Shetty & Brownson, 2007).

### ***Continuity of care.***

The Diabetes Initiative (2006) defined continuity of care as “the co-ordination and smooth progression of a patient’s care over time and across disciplines. Continuity of care is supported by systems that use a team approach to care, schedule planned visits and follow up on visits and lab work” (p.10). Shetty and Brownson (2007) also discuss organizational factors that support continuity of care, such as data systems that: 1) ensure the patient is being assigned to the correct provider, 2) plan and schedule regular visits, 3) track follow up visits, and 4) monitor laboratory tests to ensure that care guidelines are being met.

### ***Co-ordination of referrals.***

Co-ordination of referrals in primary care is not only limited to the referrals made between primary care physicians and specialists, but between primary care physicians and other health care providers such as educators. For the purpose of this study, co-ordination of referrals involves the referrals made by physicians to diabetes educators for self management support.

Peyrot et al. (2009) found that diabetes educators believe that physician referrals to DSMS are a key motivator for patients; however they reported that many physicians were not aware of the

proper procedure for referring patients to DSMS. Indeed incomplete or inappropriate referrals can be a major barrier to access of DSMS programs. Educators may be missing important patient information because of incomplete referrals, such as current level of glycemic control or medications. As a result, patients may not be triaged into the appropriate program, with the appropriate provider at the appropriate time. The co-ordination of referrals should be supported by organizational support systems such as data systems that are able to track referrals, identify referrals that are incomplete, monitor follow up with patients and / or the referring specialist (ICIC, 2006).

***Systems to document diabetes self management interventions.***

Just as the complete and accurate referral process is a key organizational support for diabetes educators, so are systems to document the provision of diabetes self management interventions. In diabetes programs a patient may see a CDE who is a nurse for one aspect of DSMS, and may see a CDE who is a dietitian for another. Therefore it is critical that all providers [RNs and RDs] are able to document the care they provided in a central location which can be accessed by all members of the health care team. The Diabetes Initiative (2006) explains this organizational factor as “standardized processes used by members of the patient care team to record patient self-management goals and progress notes into patient charts (or electronic medical records) and routinely monitor their progress” (p.10). For example, a patient may see a nurse (CDE) for 30 minutes, and during that time, a goal for testing blood glucose might be set. In the next 30 minutes, the patient may see a dietitian (CDE). Ideally, both healthcare providers can see the documentation in order to assess what has been done, what education has been given,

and what goals have been set. This is important to increase efficiency and avoid unnecessary duplication.

DSMS programs in the community are often not directly associated with the patient's primary care provider. Documenting the DSMS interventions given, such as goals and action plans, is important for the referring primary care provider to have as well to continue to support the patient's self management. Patients in DSMS programs often set health related goals and action plans which should be documented so that all clinicians involved in the patient's care can follow up with the patients and their articulated goals and plans.

### ***Contributions from patients.***

Contributions from patients refer to feedback from patients about the services and the quality of care provided by the health care team (Shetty & Brownson, 2007). The process can occur in a number of ways, such as focus groups, surveys, suggestion boxes, or patient advisory committees (Shetty & Brownson, 2007). Patient input is necessary to refine the quality and delivery of DSMS. In other words, when a health care organization utilizes patient input regarding the implementation and delivery of a health care service, such as DSMS, it is conceptualized as an organizational factor that promotes and enhances DSMS.

### ***Professional development.***

Professional development opportunities are an organizational support for CDEs. Professional development opportunities allow clinicians to keep their knowledge and skills in DSMS current. Some of the ways that organizations can support professional development, as suggested by the Diabetes Initiative (2006) include the organization setting expectations for continuing education, offering opportunities for training of team members, ensuring that

clinicians have orientation and training in house, and providing incentives for clinicians to adopt new practices and skills. Sen (2005) examined the continuing education needs of currently practicing nurses regarding self management support for patients with type 2 diabetes. Nurses expressed a need for more knowledge of the types of insulin and insulin administration, food and drug interactions, the prevention of diabetes complications, and current diabetic drugs to provide education to patients newly diagnosed with diabetes (Sen, 2005).

### **Summary**

While patient support has been called “what patients need” to self manage diabetes, organizational factors have been called “what health care providers need” to be able to provide DSMS for patients. The theoretical literature reviewed what patient self management is, how CDEs provide self management support for patients, and the organizational factors which support the CDE in their delivery of DSMS.

### **Empirical Literature Related to Factors Affecting DSMS Delivery**

This section synthesizes the empirical literature related to factors that may impact the delivery of DSMS as outlined above. First, the delivery of self management support will be explained, followed by a presentation of the studies’ results categorized into supports and barriers as they relate first to the delivery of DSMS by CDEs and second as they relate to patients’ use of DSMS.

#### **Delivery of self management support.**

Some studies have examined the implementation of the Chronic Care Model in primary and community care settings. Their findings suggest that implementing self management support, one element of the CCM, is perhaps more difficult to implement than others, yet the

reasons remain unclear. Crespo and Shrewsberry (2007) postulate that “less is known about how to implement self management support in chronic disease management” (p.127). Rather, most time and literature has focused on other parts of the CCM such as delivery system design and clinical information systems (Crespo & Shrewsberry, 2007).

Brownson et al. (2007) also highlight the imbalance in the implementation of the Chronic Care Model’s components, suggesting that self management support is a chronic illness management activity conducted least often in primary care. The authors also postulate that elements of the CCM with a more “structural” component may be easier to implement than self management support and may receive more attention in the literature (Brownson et al., 2007).

To that end, Brownson et al. (2007) developed the Primary Care Resources and Supports tool (PCRS) to assess the application of SMS in primary care. The PCRS is used to evaluate the delivery of SMS relative to patient factors and the organizational infrastructure that supports the delivery of SMS. It consists of two subscales assessing patient supports and organizational supports. The PCRS is not disease specific. It was first used with 20 health care teams in community and hospital based settings in the United States who were involved in a quality improvement program (Brownson et al., 2007). Study findings showed that on the patient support subscale, individualized assessment of patients’ self management education needs received the lowest mean score (4.8/10), while linking to community resources received the highest mean score (6.0/10). The item receiving the lowest mean score on the organizational support subscale was the integration of self management support into primary care (4.1/10) and the items with the highest mean scores were continuity of care (7.0/10) and ongoing quality improvement (7.0/10). These findings suggest that the assessment of patient’s self management

needs as well as integration of SMS into primary care are perhaps more difficult aspects of DSMS to deliver than other dimensions of DSMS measured by the PCRS.

Glasgow et al. (2003) also claimed that self management support was implemented least often and was the most challenging aspect of the CCM to implement. Glasgow and Strycker (2000) found that health care providers were delivering self management support activities, such as action planning and goal setting, with less frequency than metabolic measures, such as ordering blood tests.

Crespo and Shrewsberry (2007) cite two reasons for the difficulty in implementing self management support 1) self management support tends to occur “outside the medical encounter” (p.127) and is usually brief in nature, and 2) many health care providers view self management support as a synonymous term for didactic teaching. In their study Crespo and Shrewsberry (2007) examined the implementation of self management support in four rural, medically under serviced areas in West Virginia. The implementation of the self management programs was documented over twelve months. While none of the sites had CDEs, staff involved in the implementation across the four sites were medical and nursing directors, chronic disease managers, registered nurses, physician assistants, behavioral health specialists, diabetes educators and social workers. Leadership was a key finding in the successful implementation of SMS. Two health centers that had undergone a change in CEO found that staff members were reluctant to make changes in the absence of a leader. As such, the self management program was not discussed in staff meetings although there was agreement at the outset to do so. The study findings indicated that challenges to delivering DSMS might include organizational factors, such as leadership, clarity of staff roles, a collaborative vision for self management among the entire

organization, and staff training. The findings also suggested that there are challenges to supporting patients, such as having access to educational tools that are based on action planning.

The literature reviewed indicates self management support activities may be more difficult to deliver than elements of diabetes care that are more structural, such as ordering blood tests. For that reason, it is important to examine factors which might make self management support difficult to implement. In Ontario, CDEs are primarily responsible for the delivery of DSMS in community settings. To that end, the following section will review studies that have explored factors that impact the delivery of DSMS. Given the limited number of studies that examined the perspective of CDEs, factors that affect patients in accessing DSMS have also been included. Patient's perceived barriers and facilitators of DSMS are important because they may outline challenges and resources that may be inherent to the implementation of DSMS.

### **Provider Factors: Barriers and Supports**

Six studies have examined the perspectives of different health care providers (i.e. physicians, nurse educators) regarding barriers and supports to delivering DSMS, and are outlined in this section. Provider barriers and supports refer to those factors or processes that have been identified by health care providers to impact the delivery of DSMS. The factors relate to financial resources, physical resources, resources to support teaching and learning, and inter-professional relationships.

#### **Financial resources.**

Two studies found that financial resources, or funding, was a barrier to the delivery of DSMS. Sprauge et al. (1999) conducted a study on the perspectives of diabetes educators regarding barriers to implementation of diabetes programs and found that lack of internal

funding was reported by 51% of the sample (n=143) as a barrier to the delivery of DSMS. In another study that examined use of DSMS, educators perceived “lack of financial support” as being “somewhat” of a barrier for patients (Peyrot et al., 2009). While Sprauge et al. (1999) did not indicate the setting in which CDEs in the study worked, Peyrot et al. (2009) indicated that half of the sample worked in a hospital setting, 14% in a physician’s office, and 13% in independent or freestanding clinics.

### **Program resources.**

Program resources are factors that have the potential to affect DSMS delivery. One study evaluated CDEs perspectives of barriers that affect access to DSMS and patient use of DSMS and reported lack of staffing, program materials, and space (Sprauge et al., 1999). A second study that explored CDEs’ perspectives of factors related to access of DSMS cited lack of clerical and administrative support as barriers (Peyrot et al., 2009).

### **Resources to support teaching and learning.**

Ongoing professional development has been cited as a support to CDEs responsible for delivering DSMS. Reddy et al.’s (2011) qualitative study found that registered nurses reported ongoing training and development to be supportive of their role as group facilitators in diabetes prevention programs because it enhanced their knowledge and skills. These nurses also had support from other sites. In the study, those who were facilitating diabetes prevention groups underwent training for facilitation; processes were established to maintain competencies; staff had face to face meetings with other sites; regular technical assistance was provided; and an annual meeting was held for staff involved in the diabetes prevention programs. These findings

suggest that those facilitating diabetes prevention support were equipped with knowledge and skill acquired through continuing professional development to deliver their intervention.

In their study, Funnel et al. (2006) reported that 52.6% of CDEs rated continuing education conferences as having a great influence on their practice. In addition, 58.1% of respondents mentioned mentorship opportunities as having some influence on their practice.

### **Inter-professional perspectives on self management support.**

Differing inter-professional perspectives between physicians and diabetes educators is a factor identified as influencing the delivery of DSMS. Although not well understood or directly examined, results of some studies suggest that the relationship between CDEs and primary care physicians plays an important role in the delivery of DSMS. For example, when establishing two diabetes prevention programs, nurses facilitating program implementation explained that gaining credibility from primary care physicians was needed to have diabetes prevention programs accepted in the community (Reddy et al., 2011). In a second study that examined diabetes educators' perspectives of patient barriers that potentially affect access to DSMS, 57% of educators reported the perception that the physician does not promote education as a contributing factor to patients' attrition rates from DSMS programs (Sprauge et al., 1999).

A third study examined factors that related to accessing DSMS, from patients', physicians' and educators' perspectives (Peyrot et al., 2009). Educators were given a list of potential barriers to DSMS and rated the perceived importance of each barrier using a scale (0=not at all important, 33.3 = slightly important, 66.7 = somewhat important, 100 = very important). The barrier that was perceived by educators to have the greatest importance in influencing DSMS delivery was "physicians do not tell patients that DSMS is important",

followed by “physicians do not recognize program quality”, and “physicians do not want to lose control of patient” (Peyrot et al., 2009, p.256). Primary care physicians rated belief statements about DSMS using the same scale. Physicians strongly agreed with the following statement that they “do not have enough [DSMS] referral sources”, followed by “patients are told to do things I do not want”, and “patients are not interested in DSMS” (Peyrot et al., 2009, p.256). Conversely, diabetes specialist physicians most strongly agreed with the following statements: “patients are told to do things I do not want”, “my patients are not interested in DSMS” and “do not have enough DSMS referral sources” (Peyrot et al., 2009, p.256).

These findings suggest a number of problems (Peyrot et al., 2009). First, physicians may not be referring patients to DSMS programs because they perceive they do not have enough referral sources. Educators perceive physicians to have an influence over whether or not a patient attends DSMS, however, some educators perceive that physicians are not referring patients to DSMS because physicians think their patients are not interested in DSMS. It may be for that reason, that educators perceive physicians do not tell patients that DSMS is important. The perception of why patients are not being referred to DSMS differs between physicians and CDEs, implying a potential problem in communication between physicians and educators.

In a separate study, Peyrot and Rubin (2008) found that patients and educators both reported that physicians often do not refer patients to DSMS services, and if they do, they do not emphasize the importance of such support to patients, or downplay the seriousness of diabetes. When prompted to give an explanation for why physicians are not referring patients to DSMS, diabetes educators suggested that perhaps it was time consuming to refer, or that the referral paperwork was confusing. Furthermore, educators reported that physicians only referred patients

for DSMS if treatment results were not good. Physicians reported that educators sometimes gave treatment recommendations that they did not agree with. Physicians believed they were best able to provide DSMS, and that patients responded better to support from their own physician. Physicians stated that the quality of DSMS was poor in that it did not reflect real world situations, was not personalized to patient individual needs, or was too advanced for patients. Peyrot and Rubin (2008) suggest that this view may be reflective of older styles of diabetes self management support, and that it is not clear if this perspective is reflective of current DSMS services.

The literature highlights some important incongruencies between barriers to DSMS reported by physicians and barriers reported by diabetes educators. A difference in perspectives about DSMS between physicians and educators could be a barrier because physicians are typically the key to referring patients to DSMS services. Educators provide DSMS and need to be able to communicate effectively back to referring physicians. Ultimately, inter-professional differences in perspectives about DSMS between educators and physicians may compromise both access to and delivery of DSMS.

## **Summary**

In summary, six studies reported factors that could impact CDEs delivery of DSMS. The lack of adequate financial resources, program resources, resources to support teaching and learning, and differing inter-professional perspectives may pose barriers to DSMS. While these factors have been briefly described in empirical literature they have not been adequately detailed; therefore their influence on DSMS delivery in community settings is not well understood. It is

important to further examine how barriers and supports affect the delivery of DSMS by CDEs in community based settings.

There was diversity in the settings in which the studies took place. Sprauge et al. (1999) made no mention of the setting in which participating CDEs worked. Peyrot et al. (2009) indicated that 50% of educators in the study worked in hospital settings, 14% in physicians' offices, and 14% in freestanding education clinics. Rubin and Peyrot (2008) reported similar settings, including hospitals, freestanding clinics, and physicians offices. Nurses in Reddy et al.'s (2011) study were not certified diabetes educators, but were nurses trained in the delivery of a diabetes prevention program in primary care settings. Finally, Funnel et al. (2006) only mentioned that CDEs in the study worked with outpatients. The present study, however, focused on CDEs working in community based settings.

### **Patient Factors: Barriers and Supports**

Much diabetes self management research has focused on the patients' perspectives of the supports and barriers to DSMS. Patients' perspectives are important since they are the focus of DSMS and their perspectives may highlight some of the barriers and supports that are inherent to the CDE delivering DSMS. This section describes the findings of nine studies that discussed patients' logistics, support, health beliefs, physical, psychological / psychosocial and educational factors.

#### **Physical factors.**

Results of several studies have outlined physical factors as barriers to patients managing their diabetes. Physical factors include pain associated with treatments (such as monitoring blood glucose levels) (Chelbowy, Hood & LaJoie, 2010), memory failure, (Chelbowy et al.,

2010), competing health priorities such as co-morbid conditions (Gucciardi et al., 2008), poor vision (Rhee et al., 2005), reading comprehension (Rhee et al., 2005), hearing problems (Rhee et al., 2005) and limited mobility (Peyrot & Rubin, 2008). Physical factors could prevent patients from seeking DSMS and / or from carrying out self management recommendations. For instance, patients experiencing physical challenges may be less likely to seek DSMS opportunities, or to continue with ongoing follow-up.

### **Logistics.**

In a number of studies, the theme of “timing” was frequently perceived by patients as a barrier to DSMS. Two factors related to time have been described. First, the time at which DSMS is offered was reported as a barrier (Peyrot & Rubin, 2008). Conflicting work schedules affected patients’ ability to access DSMS (Gucciardi et al., 2008; Khan et al., 2011; Reddy et al., 2011). The second time related factor was the number of classes. For some patients, the time commitment required to attend all classes was a barrier and led to attrition (Khan et al., 2011).

Transportation is another influential factor. Reddy et al. (2011) found that travel distance was a barrier for patients, as well as transportation to and from the diabetes centers where DSMS was given (Khan et al., 2011; Peyrot & Rubin, 2008). Gucciardi et al (2008) in their research about diabetes program attrition found that proximity to the diabetes center and difficulty locating the center were both factors affecting attrition rates. Participants in Peyrot and Rubin’s study (2008) felt that the most convenient location would be at their family doctor’s office. Transportation, distance from the center, and the amount of time it takes to get to diabetes centers where DSMS services are offered are major barriers to patients accessing DSMS. Time and proximity to diabetes programs are factors that may affect when and how CDEs deliver DSMS,

i.e. in person or by phone. These findings give some insight into patient preference about where they would like to access DSMS, and reveal that patients find community settings, such as doctor's offices to be most convenient.

### **Support.**

Another factor affecting patients' ability to self manage and seek DSMS is support from others. Chelbowy et al. (2010) found that family support was a major factor in patients seeking DSMS from health care providers. Gucciardi et al. (2008) also examined patient reasons for diabetes program attrition; patients reported that not having family members to accompany them to appointments prevented them from continued attendance and follow up at diabetes centers.

The second area of support that influenced patients accessing DSMS was physician support. Specifically, physician expression of the severity of the disease was related to program attrition in one study (Gucciardi et al., 2008). Patients had a tendency to withdraw from DSMS if they had a low perceived seriousness of the disease which was inferred from physicians' statement that they had "borderline", "mild diabetes" or that their disease "is not too serious" (Gucciardi et al., 2008, p.6-7). Thus, family support and physician perception of the seriousness of diabetes are two areas of support which may affect patients' utilization of DSMS services.

### **Patients' perceptions about their vulnerability to diabetes and its consequences.**

Health beliefs may affect patients' access and attendance at DSMS. According to the Nursing Outcome Classification system, health beliefs are personal views that impact health behaviors (Moorhead et al., 2007). Because diabetes requires the patient to have some level of

self management, health beliefs are important in this population because they provide insight into the way patients will manage their diabetes.

One such health belief reported by some patients in the literature is the conviction by the patients themselves that they have enough knowledge of diabetes and therefore may not need DSMS. Two studies reported that patients perceived they had enough knowledge of diabetes self management gained through self information seeking (Chelbowy, et al. 2010; Gucciardi et al., 2008). Educators have also noted this belief among their patients (Sprauge et al., 1999).

Another health belief, or disbelief, is denial. Sprauge et al. (1999) found that educators believe some patients were in denial about having diabetes. Denial may influence health behaviors. If one does not believe they have diabetes, they may not think that they are required to manage the disease. One possible form of denial is a patients' judgment about the severity of the disease, in which patients deny that their disease has a significant impact on their lives. Gucciardi et al. (2008) found that patients' judgement of the severity of their disease led to attrition from diabetes programs. Apathy was also found to contribute to high attrition rates (Gucciardi et al., 2008). Patients who do not view their diabetes as a priority may be less likely to self manage the disease, thereby making CDEs' role more challenging in DSMS delivery. CDEs would have to apply additional strategies to promote patients' complete participation in tasks, including goal setting, action planning for change, and continuous follow up visits.

Patients' health beliefs could impact the CDE's ability to deliver DSMS. If a patient does not believe that they have diabetes, or that diabetes does not have serious implications for their overall health, they may not be motivated to change their health behaviors, reflective of self management of diabetes. If patients are not motivated or willing to make changes or seek

DSMS, the CDE's role in delivering DSMS is inherently affected. CDE's ability to deliver DSMS depends largely on the patients' readiness and willingness to seek out support, and to make changes in health care behaviors.

Another patient barrier was the ability of patients to implement and sustain changes. In one study, participants identified that depression was one barrier that impeded change, because it kept them from achieving their goals, and influenced their ability to make changes (Reddy et al., 2011). The same study also found that participants who were successful in sustaining change felt ready to make changes (Reddy et al., 2011).

#### **Factors related to patient knowledge / understanding.**

The final group of patient factors to be examined in this review relates to knowledge and understanding. In some studies, patients appeared to have misunderstood or misinterpreted important information on DSMS. Gucciardi et al. (2008) found that some patients thought there was no need for DSMS because they were having regular visits with their physician and lacked familiarity with the services that were offered at diabetes education centers as they were not being informed of these by their primary care provider. Peyrot and Rubin (2008) reported similar findings; patients were unaware of what DSMS was, and they were unaware of the need for it. Other factors reported to influence patients' knowledge and / or understanding were: problems with English language (Rhee et al., 2005), and language and literacy problems (Peyrot & Rubin, 2008).

#### **Other.**

Other barriers to patients' engagement in DSMS were lack of effective appointment reminder system, family responsibilities (Gucciardi et al., 2008), and the absence of a daily

routine (Chelbowy, et al., 2010). Another reported barrier was that patients did not conduct or obtain metabolic measures which impacted the CDEs ability to follow up with patients (Sprague et al., 1999).

### **Gaps in the Literature**

The reviewed studies focused on barriers to implementation of DSMS, as well as factors affecting access to DSMS. The samples in these studies represented patients, physicians, other health care providers, and CDEs. The focus of the majority of these studies was on patient factors affecting access and use of DSMS, and not on the factors affecting clinicians' delivery of DSMS. Because of the specific certification requirements and roles that CDEs have in Ontario, the findings of these studies may not be applicable to the context of DSMS implementation in this province. However, the studies do give insight into some of the factors that might affect CDEs' implementation of DSMS, and the need for further studies that examine the perspectives of CDEs.

Of the studies included in the literature review, only one was in a Canadian context (Gucciardi et al., 2008). Given the differences in health care delivery between Canada and other countries, more research is needed that represents a Canadian context. Furthermore, given the recent shift in the delivery of diabetes programs in Ontario from hospital to community based settings, studies are needed that examine DSMS in a community based context. Diabetes programs are currently available in a variety of community settings in Ontario, such as family health teams, community health centers, family doctors' offices and aboriginal health centers. Thus, it is necessary that research should focus on community settings that are relevant to the care delivery structure in Ontario.

## Summary

The literature suggests that DSMS is a complex intervention that may be challenging to implement. For that reason, DSMS requires processes in place to support patients, and organizational infrastructure and resources to support those delivering DSMS. The studies reviewed have highlighted that DSMS is a chronic illness management intervention that is delivered with less frequency than other activities constituting the CCM. Some of the factors identified that can affect DSMS delivery, as reported by health care providers' were financial resources, physical resources, resources to support teaching and learning, and inter-professional relationships. Patient factors that affect access and use of DSMS included physical, logistics, support, response to illness, and patient knowledge factors.

To date there are no known studies that examined the perspectives of CDEs working in Ontario community settings regarding their ability to implement the various components of self management support for patients living with diabetes. This study was among the first to examine and describe the perspective of CDEs in the delivery of DSMS and the factors that influence their ability to deliver DSMS.

## **Chapter 3 Framework**

### **Chronic Care Model**

The Chronic Care Model (CCM) serves as a framework to support chronic illness care, including diabetes care, for health care organizations (ICIC, 2006). Self management support is subsumed under the CCM, and the CCM identifies contextual resources to facilitate care delivery. For these reasons the CCM was used as a framework to guide this study. The CCM has primarily been used as a framework to direct the implementation and delivery of various health care changes to support chronic illness care. The CCM has been used in a number of studies to guide and test quality improvement strategies and patient health outcomes in chronic illness care, including diabetes (Piatt et. al., 2006), pediatric asthma (Mangione-Smith et. al., 2005), heart disease (Vargas et. al., 2007), and obesity (Ely et. al., 2008). Outcomes of CCM evaluation studies showed improvements in patient outcomes such as lower levels of glycosylated hemoglobin (hemoglobin A1C), a marker of glycemic control (Piatt et. al., 2006), an increase in the number of patients who measured peak flow and created asthma action plans (Mangione-Smith et al., 2005), reduction in cardiovascular disease risk factors (Vargas et. al., 2007), and reduction in weight in pounds (Ely et. al., 2008). Because use of the CCM can result in improved outcomes it is important to examine the extent to which elements of the CCM, such as self management support, are being delivered as variability and inconsistency in delivery could impact the achievement of intended, beneficial outcomes.

#### **Background.**

Health care delivery has historically focused on acute, episodic care, and the CCM was developed by staff at the MacColl Institute for Healthcare Innovation in the United States to

respond to the needs of patients with chronic illnesses (Institute for Chronic Illness Care (ICIC), 2006, The Chronic Care Model). The model was designed to facilitate change in care delivery at various levels including the “community, organizations, practice and patient level” (ICIC, 2006, The Chronic Care Model, para. 5). The shift of health care delivery design that is described in the literature is a movement away from “reactive” (Coleman et. al., 2009, p. 75) acute care to “proactive, planned and population based” (p.75) chronic illness care (Coleman et. al., 2009; ICIC, 2006). The aim of the CCM application is to improve practices as well as health outcomes (Coleman et. al., 2009). The model came about after a review of intervention literature regarding the care of chronic illness; the literature revealed four practice domains that brought about the greatest improvements in patients’ health outcomes (McCulloch et al., 1998; Wagner et. al., 1996). These domains included: using information technology to compile registry databases, improving clinicians’ knowledge and skill, self management support for patients, and turning the care model from individual practices to team based practices (Renders et. al., 2001). From these findings, the elements of the CCM were defined. While the current study focused on self management support for patients, the six elements of the CCM model are briefly described.

The six elements of the CCM are defined by Coleman et al. (2009) as “interrelated systems” (p.75) that include the community, the health system, self management support, delivery system design, decision support, and clinical information systems (ICIC, 2006, Model Elements). ICIC (2006) defines each element of the model and provides broad guidelines for its implementation.

### **The community.**

The community can be instrumental in the management of chronic care. The task defined by the ICIC (2006) that relates to the community is the need for health care organizations to link with community resources to meet the needs of patients with chronic illness. The CCM outlines some important connections between health care organizations and the community, which suggest that practitioners should encourage patients to seek out community resources and programs, form partnerships and linkages with organizations that already exist in the community to avoid duplication of services, and advocate with large organizations, such as the Canadian Diabetes Association, for improvements in chronic illness care (ICIC, 2006, Model Elements).

### **The health system.**

The task of the health system is to create an environment that supports high quality care. It includes the support of improvement initiatives at all levels of the institution, stimulation of system wide changes, and provision of a system to deal with mistakes with the goal of improving care (ICIC, 2006, Model Elements).

### **Delivery system design.**

Delivery system design is aimed at ensuring care and self management support are delivered efficaciously and in an orderly manner. This is accomplished with the following tasks: role clarification throughout the team, planned interactions that are empirically substantiated, case management for complex cases, routine follow up and cultural competence (ICIC, 2006, Model Elements).

### **Decision support.**

Decision support is defined by the Institute for Chronic Illness Care (ICIC) (2006) as congruency in care with both empirical knowledge and patient choice. It entails the tasks of ensuring evidence based guidelines are integrated into practice, sharing these guidelines with patients, using well developed and evidence informed educational methodologies, and integrating specialty physicians' knowledge and experience into decisions made about chronic illness care (ICIC, 2006, Model Elements).

### **Clinical information systems.**

The next element of the CCM is clinical information systems aimed at structuring patient and population data within information technology. This technology has the ability to: 1) provide reminders to health care providers as well as patients, 2) identify groups for proactive care (i.e. all patients in the practice who have diabetes), 3) plan individual as well as group care, 4) share information within teams and with patients for collaboration, and 5) assess indicators of the organization (ICIC, 2006, Model Elements).

### **Self management support.**

Self management support (SMS) aims to motivate and support patients to manage their condition and the care of their condition in the broader health care context (ICIC, 2006, Model Elements). The ICIC (2006) outlines three tasks for health care providers to deliver self management support. First, health care providers direct patients to govern their own health. Second, health care providers use the following techniques to provide self management support “assessment, goal setting, action planning, problem solving and follow-up” (ICIC, 2006, Self Management Support, para. 1). Finally, health care providers are responsible to sustain SMS by

providing patients with resources within and outside of the health care organization (ICIC, 2006).

### **Patient provider relationships.**

Not only does the CCM outline the dimensions of chronic illness care, it also highlights the role of both the patient and the health care provider. The model views the patient as informed and activated, and describes the health care providers as prepared and proactive (ICIC, 2006, The Chronic Care Model). Prepared and proactive means that health care providers deliver care that incorporates the six elements of the CCM as outlined above. The model also describes the exchanges between the patient and the provider as productive interactions. The CCM suggests that both the health care providers and patients play an important role in the management of chronic illness. If patients are not engaged, the provider cannot implement DSMS meaningfully. Similarly, if the provider is not prepared and proactive, he or she cannot support the patient.

### **Study Framework**

The framework for this study was adapted from and focuses on one element of the Chronic Care Model (ICIC, 2006, Model Elements), namely self management support. This study examined the extent to which CDEs delivered patient supports and the extent to which organizational factors were in place to facilitate such delivery.

### **Patient supports.**

Patients are encouraged to take responsibility for their own health and healthcare according to in the CCM, and health care providers are responsible for facilitating patient self management, by providing the patient with support. In this study, patient involvement in the patient support process was conceptualized as patient collaboration, including families where

appropriate, in the planning and decision making regarding their health care (Diabetes Initiative, 2006). In this way, patients' input into decisions is valued, and reflects a shared process in clinical decision making (Diabetes Initiative, 2006). Conceptually, patient support refers to strategies that health care providers use to empower patients to manage their own health and health care; the strategies involve placing an emphasis on the role of the patient and providing them with self management support. In this study, patient support included individualized assessment, goal setting, action planning, problem solving and follow up, as well as providing patients with links to community resources (ICIC, 2006, Model Elements). These dimensions of patient support were operationalized in this study using respective items on the Primary Care Resources and Supports tool (PCRS) (Diabetes Initiative, 2006).

Individualized assessment has been conceptualized by the Robert Wood Johnson Foundation *Diabetes Initiative* (2006) to include individualized assessment of the patient's self management education needs by determining client focused "education needs, barriers, skills, preferences, learning styles and resources for self management" (Diabetes Initiative, 2006, p.9). Another dimension of assessment is emotional health. Emotional health assessment was conceptually defined to include regular assessment of patients' thoughts, feelings and moods by the CDE (Diabetes Initiative, 2006). Conceptually, emotional health assessment included systems put in place for emotional health assessment, and the use of standardized screening tools. Patient social support is another dimension of patient assessment and was conceptually defined as emotional, tangible, information or feedback available to patients through their social network including family, friends, neighbours and or peers (Diabetes Initiative, 2006).

Based on the individualized patient assessment, self management education is provided. Self management education was conceptualized as one aspect of self management support which includes the provision of information to help patients' manage their diabetes, activities of daily living and the emotional sequelae of living with a chronic condition (Diabetes Initiative, 2006).

Conceptually, problem solving skills referred to those skills patients can acquire and utilize to overcome self management problems (Diabetes Initiative, 2006). The Diabetes Initiative (2006) outlines a series of steps inherent in problem solving, namely, identification of the issue and solutions, choosing a solution, evaluating the results of the chosen solution, and planning future steps according to the resolution of the problem. Goal setting and action problem stem from problem solving. Goal setting has been conceptualized as health care providers and patients collaboratively identifying an area of health care on which the patient wishes to focus. Action planning included outlining a plan to meet the goal (The Diabetes Initiative, 2006).

In this study, follow up included providing the patient with links for ongoing support through community resources. Community resources were conceptualized as offering patients links to programs and services that support self management which may be available through a number of community organizations such as schools, churches, and work places (Diabetes Initiative, 2006).

### **Organizational supports.**

Organizational supports may shape health care providers' ability to deliver self management support for patients with a chronic disease, such as diabetes. For example, organizational factors such as professional development opportunities for staff may assist

practitioners in gaining more knowledge, skill or practice with self management support, and therefore potentially facilitate provision of self management support for patients. Furthermore, the CCM states that all elements of the CCM are inter-related, suggesting that the organization of health care resources and policies are necessary for the delivery of self management support (ICIC, 2006). Organizational factors have been conceptualized as processes put in place within the health care organization to support DSMS such as continuity of care, team based care, professional development opportunities for staff, referral process, and documentation systems for diabetes education (Brownson et. al., 2007). In this study, organizational factors were operationalized using respective items on the Primary Care Resources and Supports (PRCS) tool (Diabetes Initiative, 2006).

Continuity of care is the first organizational factor, which was conceptualized to include regular appointments and follow up sessions, that are coordinated to ensure seamless patient care “over time and across disciplines” (Diabetes Initiative, 2006, p.10). To ensure continuity of care, it is important to coordinate the referral process. Coordination of referrals has been conceptually defined as “effective collaboration and communication among primary care providers and specialists. Coordination of referrals is supported by systems that track referrals, monitor incomplete referrals and ensure follow up with patients and or the specialists to complete referrals” (Diabetes Initiative, 2006, p.10).

Systems for documenting self management support were conceptualized as methods used by CDEs to record patients’ goals and communicate patients’ progress toward goal achievement with other health care providers (Diabetes Initiative, 2006). This also includes having systems in place to track patient progress.

Ongoing quality improvement was conceptualized as: the use of data to find trends, activities to improve care delivery, and measurement of the results of improvement initiatives (Diabetes Initiative, 2006). Patient input is another form of data that can be used for quality improvement. Patient input was conceptually defined as feedback from patients regarding service delivery and quality of services provided. The feedback may be obtained through “focus groups, surveys, suggestion boxes or patient advisory committees” (Diabetes Initiative, 2006, p. 10).

The integration of self management support into primary care was conceptualized as a shared vision for SMS by the patient care team, and a standard practice available to all patients with diabetes within primary or community care settings (Diabetes Initiative, 2006). Patient care team refers to the vision and culture of health care organizations to have a group of multidisciplinary professionals deliver and co-ordinate patient care (Diabetes Initiative, 2006).

In order to build knowledge and acquire relevant skills to provide DSMS, CDEs require ongoing opportunities for professional development through education and training. Staff education and training was conceptualized as opportunities for health care providers to increase knowledge and acquire skills that will help them improve the delivery of SMS (Diabetes Initiative, 2006).

## **Summary**

While the CCM consists of 6 interconnected domains, the current study focused on DSMS, both patient support and organizational support. The patient support factors examined were individualized assessment, education, goal setting, action planning, problem solving, emotional health, patient involvement in decision making, social support and follow up. The

organizational supports examined were continuity of care, co-ordination of referrals, quality improvement, documentations systems for self management support, patient input, integration of SMS into primary care, multidisciplinary care team and staff training.

## **Chapter 4 Methods and Procedures**

### **Design**

The design for this study was exploratory descriptive. This design is most appropriate to explore topics for which not much is known and to “identify problems with current practice” (Burns & Grove, 2009, p.237). Although diabetes self management support (DSMS) has well documented outcomes in community and hospital settings, the delivery of DSMS in community care teams is relatively new and the factors that affect certified diabetes educators (CDEs) in delivering DSMS within these teams have not been well examined or documented. This study involved administering a questionnaire to assess the extent to which CDEs report being able to deliver DSMS and the factors that enhanced or inhibited the delivery of DSMS.

### **Sample**

#### **Target & accessible population.**

The target population for this study was registered nurses and dietitians who are CDEs and provide DSMS in community settings in Ontario. The accessible population was CDEs who are members of an Ontario chapter of the Canadian Diabetes Association Diabetes Educator Section (DES).

The following paragraph describes the rationale for narrowing the target population to a more focused and accessible population. First, the number of CDEs in Ontario is approximately 1200. Because the number of CDEs is small and they work in a variety of geographically dispersed institutions, it was difficult to reach most of potentially eligible CDEs. Second, the names and contact information of diabetes educators are not readily available; therefore, the researcher looked for opportunities to conveniently access a cohort of CDEs at one time. It was determined that CDEs may voluntarily join the Canadian Diabetes Association - Diabetes

Educator Sections, which are divided into sections based on geographical location, and meet bimonthly. However, it was again difficult to delineate the accessible population, as those who belong to a DES chapter, do not necessarily attend any or all of the meetings. Third, those who attend DES meetings may be practicing in settings such as hospitals that do not meet the inclusion criteria for the study. Therefore, the accessible population was limited to DES members who attended DES meetings, or who were part of the DES email list-serve.

### **Sampling method.**

A convenience sampling method used for this study. Convenience sample subjects are “included in the study because they happened to be in the right place at the right time” (Burns & Grove, 2009, p.353), in this case, members of DES groups. In convenience sampling, individuals are recruited until the desired sample size has been reached. Convenience samples are more accessible than other types of samples, are appropriate for the exploratory descriptive nature of the proposed study and are a feasible approach to reach the accessible population (Burns & Grove, 2009). Burns and Grove also suggest that convenience samples allow studies to be done to gain information in previously unexplored areas. Therefore, for the purpose of accessibility and feasibility, as well as the descriptive exploratory nature of the study, the sample was recruited using a convenience sample. A limitation of a voluntary, convenience sample is the potential for participants to form a biased sample inclusive of only those who are willing to respond to the study questionnaire. For that reason, anonymity of responses was maintained in order to ensure that responses could not be linked to the participants in order to facilitate truthful responses.

### **Inclusion criteria.**

Inclusion criteria for the study were 1) registered nurses (RNs) or registered dietitians (RDs) who hold CDE certification, and 2) community based work place setting, such as single physician practices, family health teams (FHT), family health networks (FHN), family health organizations (FHO), community health centers (CHC) in Ontario.

### **Sample size considerations.**

The size of the sample could not be determined by a power analysis due to the descriptive nature of the study. Therefore, the target sample was set to 30-50 participants, based on the minimum number of participants needed for basic statistical analyses ( $n=30$ ) (Salkind, 2000). The second consideration for the sample size was response rates. Two American studies targeting CDEs reported differing response rates. Sprauge et al. (1999) studied diabetes educators' perspectives on barriers to access and use of diabetes education services, using a mailed survey and reported a response rate of 64% (Sprauge et al., 1999). Funnell et al. examined the factors that affect CDE practice, using a mailed survey, and reported a response rate of 46% (Funnell et al., 2006). Therefore the response rate anticipated for the proposed study ranged between 40-60%. Thus, a target recruitment of approximately 50-70 participants was required to gain a sample of 30 based on anticipated response rates of between 40 and 60%.

### **Setting**

The setting was made of up various locations where DES chapters met, typically in private meeting rooms of public facilities. These rooms consisted of tables, chairs, and audio-visual equipment. The data were collected in the locations where DES chapters met, for participants who completed the study questionnaires at a DES meeting. Participants had the

option of returning the survey to a drop box located at the meeting site, or taking a postage paid envelope to return the study package to the researcher by mail.

Alternately, those who were interested in participating in the study, who did not attend the DES meetings, but belonged to DES chapters and who contacted the researcher directly, were mailed a study package, and had the option of completing the questionnaire in the location of their choice.

These types of settings are uncontrolled which has the potential to increase the risk of random error in responses associated with extraneous environmental factors (Burns & Grove, 2009). To control for the latter factors it is important that the environment be the same for participants (Burns & Grove, 2009). While the location of the meetings differed with each group, the context of the meeting remained constant, as did the procedure for recruitment, data collection and follow up emails, regardless of where the participant completed the survey.

A second method of controlling for extraneous factors that was employed in this study was the delivery of detailed instructions for completing the questionnaire. All instructions were given by the researcher and remained the same for each of the three meetings. Thus, all participants were given the same instructions for completing the questionnaire to reduce the potential for error caused by improper completion of the study questionnaire. Respondents who participated in the study by emailing the researcher and completing the study by mail were given the same written instructions as those who participated at the DES meetings.

### **Ethical Considerations**

Approval to conduct this study was obtained by the Research Ethics Board at Ryerson University. Permission was also granted by the chair persons of the DES chapters outlined

above. Participation in the study was voluntary. The potential risk of participating in the study was minimal (Burns & Grove, 2009). There were no known direct benefits to the participant. There were no monetary benefits or honorarium for participation in the study.

A letter of consent information (Appendix A and B) was provided in the study package which outlined the voluntary nature of the study, the invitation to participate in the study, anonymity of potential participants, the anticipated time required to participate, confidentiality procedures, and the implied consent process. Consent for participation in the study was implied on the basis of participants returning the study package. Implied consent is an appropriate strategy for studies with minimal risk as outlined by Burns and Grove (2009) and has the advantage of maintaining the anonymity of study participants.

Study participants remained anonymous to the researcher. No identifying information was collected on the study questionnaires. Participants who completed the study at the DES meetings returned the study package in a sealed envelope to a designated drop box at the completion of the DES meeting. Participants who completed the study by mail, returned the study package to the researcher using the self addressed, postage paid envelope.

Confidentiality was and will be maintained through secure data storage in the researcher's home office in a locked drawer, and an electronic data base will be saved on a password protected computer. Data about work place setting was gathered and reported categorically, which minimizes the risk of identifying CDEs from any one organization. The data will be destroyed after a period of five years from the completion of the study.

## **Measurement Methods**

Three tools were used to collect pertinent quantitative and qualitative data: 1) a demographic questionnaire, 2) the Assessment of Primary Care Resources and Supports for Chronic Disease Self Management (PCRS), and 3) three open ended questions considering factors that enhance or inhibit the implementation and delivery of DSMS.

### **Demographic information.**

Demographic information was collected through the Demographic Information Questionnaire (Appendix C) developed by the researcher and used to describe the sample. Demographic characteristics encompassed attributes that were relevant to DSMS delivery by CDEs; these included: practice setting, profession, years as a CDE, age range, members of the DSMS team, and program funding source.

### **Assessment of Primary Care Resources and Supports.**

The main instrument used in the study was the Assessment of Primary Care Resources and Supports for Chronic Disease Self Management (PCRS) tool (Diabetes Initiative, 2006). This tool assessed the extent to which CDEs report being able to implement DSMS in the areas of patient and organizational factors. The tool contains eight items related to patient support, and eight items related to organizational support. The patient support subscale included the following domains: individualized assessment, self management education, goal setting and action planning, problem solving skills, emotional health, patient involvement, patient social support and links to community resources. The eight items evaluated on the organizational support subscale were continuity of care, coordination of referrals, ongoing quality improvement,

systems for documentation of SMS, patient input, integration of SMS into primary care, patient care teams and education and training.

In the original development of the PCRS tool, content validity was established by consultation with field experts, three stages of pilot testing, and feedback from external consultants (Brownson et. al., 2007). Results of the pilot testing showed that the tool was relevant for use with health care teams and organizations (Brownson et. al, 2007). The reliability of the PCRS tool was evaluated with health care professionals who participated in a health care quality improvement program (Brownson et. al., 2007). Cronbach's alpha co-efficients were calculated for each subscale; the co-efficients were 0.94 and 0.90 for organization and patient support, respectively, which supported internal consistency reliability of items measured on the subscales. Despite the tool being relatively new, its previous reliability and validity suggest it is appropriate to use with health care professionals for research purposes.

The PCRS consists of 16 items which measure each of the dimensions of patient and organizational support (Diabetes Initiative, 2006). Participants were asked to respond to each item on a scale of 1 to 10 where 1 represents "does not exist" and 10 represents the consistent implementation of the dimension of DSMS being measured by the item. Each item was scored individually, and was also scored as part of the sub scale. For example, goal setting is an item under patient support, and receives an individual score out of ten, and is also included in the total score for patient support. Each sub-scale, patient support and organizational support, receives a total score summative of the eight items present in that sub-scale. Therefore the possible range of scores for each sub-scale is 8-80.

All numeric scores on the PCRS tool correspond to an alphabetic score representing a quality level from A-D which reflect the consistency and comprehensiveness with which the various dimensions of DSMS are being delivered. A numeric score of 1 corresponds to a D quality level which refers to a lack of structure or processes in place to facilitate SMS implementation (Diabetes Initiative, 2006). A score of 2-4 corresponds to a C quality level. Level C refers to a level of integration between the patient and the provider, where implementation is not consistent and the interaction between the patient and the health care provider is “passive” (Diabetes Initiative, 2006, p.iii). Level B represents an organized and consistent implementation of a dimension of SMS at the team level (Diabetes Initiative, 2006). Numeric scores of 5-7 correspond to a B quality level. A quality level of “A” represents the system wide implementation and delivery of a dimension of DSMS. The PCRS tool describes level A as “addressing issues in levels B, plus the health care system, policies and environmental and or community supports” (Diabetes Initiative, 2006, p.iii). A quality level of A corresponds to a numeric score of 8-10 on the PCRS. These quality levels reflect a progressively more comprehensive implementation of each item or dimension of SMS. For example, if goal setting received a letter grade of “A” that would reflect a more comprehensive implementation / delivery of goal setting that if that item received a “B” score. In this study, the scores obtained on subscales of the PCRS tool were also reported as quality scores to discuss the key findings of the study.

One methodological limitation of using a self-report tool is the potential for participants to report their care delivery differently to what is reflective of reality, which is known as response bias (Burns & Grove, 2009). However, Burns and Grove posit that self report may be

the only means for collecting data on certain variables, such as opinions or perceptions. In this case, self report was the only means of collecting data because the focus was on CDEs perceptions about being able to deliver DSMS, and factors that affect its delivery.

### **Barriers and supports open ended questions.**

Since a suitable measure could not be found to assess factors that impact the delivery of DSMS by diabetes educators, open ended questions developed by the researcher were used to gather relevant data. The questions were:

1. What factors in your practice as a CDE inhibit you from delivering diabetes self management support?
2. What factors in your practice as a CDE enhance the delivery of diabetes self management support?
3. Please comment on anything else you think is important to know about your experiences in implementing DSMS in your practice.

### **Procedures**

#### **Recruitment and data collection.**

The researcher recruited prospective participants who were certified diabetes educators and part of DES groups. There were two phases of recruitment and data collection. In the first phase, consent was obtained by three DES chair persons in Hamilton, Windsor-Essex, and Grand River district for the researcher to attend the DES meetings and introduce the study. Meetings were attended by the researcher in an attempt to maximize enrollment. Prior to the DES meeting, the researcher sent an email to each of the three chair persons to distribute to their respective list-serve members (Appendix D). The email contained information about the

invitation to participate in the research study. The rationale for circulating this email was to allow potential participants time to decide if they would like to enroll in the study prior to attending the meeting. This email also gave potential participants the opportunity to contact the researcher directly if they were unable to attend the meeting. Those who contacted the researcher directly were mailed a copy of the study package, including a letter of information/consent, the questionnaires and a pre-addressed, postage paid envelope for the return of the study package.

The researcher attended the DES chapter meetings to provide information to potential participants about the study and to deliver the study packages. The researcher described the purpose of the study, the consent process, inclusion and exclusion criteria, the potential risks and benefits, and the protection of anonymity and confidentiality for prospective participants. After initial instructions were given, the researcher left the meeting to maintain participant anonymity and confidentiality. It was up to the discretion of the DES chair person to decide when participants would complete the study packages. Following the completion of the questionnaire, participants were provided a drop box to anonymously leave their surveys - completed or uncompleted. The researcher returned only after the meeting was adjourned to collect the study package drop box. The number of CDEs who completed the questionnaire in this manner was small, which necessitated the use of additional recruitment strategies to obtain the required sample.

In order to maximize the sample, the researcher also sent email messages to 4 other DES chair persons asking them to circulate the email to invite DES members to contact the researcher directly if they were interested in participating in the study. The initial email contained the

purpose of the study, and the inclusion and exclusion criteria. Interested participants who contacted the researcher directly were then mailed a copy of the study package including the study information form, the questionnaire and a postage paid, pre-addressed envelope to return the completed questionnaire. The researcher did not attend these DES meetings given the infrequent nature of the meetings, and the distance and time required to travel to the meetings.

Follow up emails were sent to all potential participants either through the DES chair persons (to circulate to their DES members) (Appendix E) or directly to those individuals who had been mailed a study package (Appendix F). The purpose of the follow up email was to inform potential participants that there was still time to participate in the study either by returning the completed questionnaire or by contacting the researcher to obtain a study package. Follow up emails were sent approximately one to two weeks following the DES meeting, or following the email invitation to participate in the research study.

### **Data Analysis**

Data from the PCRS and Demographic questions were entered manually into the Statistical Package for the Social Sciences (SPSS) Version 19.0 as pre-coded on the research instruments. The frequency distributions of responses to the PCRS items and demographic questionnaire were analyzed using SPSS to examine the extent of missing values and outliers. Data from the three open ended questions were typed verbatim into a separate word processing document for each question.

### **Missing data.**

Missing data have the potential to threaten external validity of studies (El-Masri & Fox-Wasylyshyn, 2005). Therefore, missing data must be handled appropriately to decrease the risk

of systematic bias. El-Masri and Fox Wasylyshyn suggest that the first step in dealing with missing data is to analyze the pattern of the missing data, namely if data are missing at random, or if the data are missing as a result of a systematic error (El -Masri & Fox-Wasylyshyn, 2005). Cohen et al. (2003) purport that data may be included in the analysis if no more than 10% of the data were missing for any one variable and this guideline was followed in this study.

Data were analyzed for pattern and extent of the missing values according to each of the subscales of the PCRS. In instances where participants had less than 10% of data missing on a subscale the researcher imputed data using case mean substitution (El -Masri & Fox-Wasylyshyn, 2005). First, the individual participants' mean was calculated for the items with completed data and the mean of those items was then imputed into the score for the item with missing responses. The subscale score was then calculated for all items including the case mean substitution for the missing item. Case mean substitution is an appropriate technique for handling data missing on items constituting a scale because each item represents an indicator of the concept being measured; thus the score of one item is substitutable for other items (El -Masri & Fox-Wasylyshyn, 2005).

#### **Summary of missing data.**

Four respondents had some missing data on the PCRS. The missing data in all four cases did not follow any pattern, and this suggested that the data were missing at random. In the first case, one item was missing from the organizational support subscale, which equated to 6.25% of data missing. In this instance, a case mean substitution was imputed. In the second case, the respondent missed one item on both subscales, therefore 6.25% of data was missing on each scale. A case mean substitution was imputed for the missing item on each scale. In the third

case, three items were missing from the patient support subscale (38%). The three items were all on the same page, which also suggests a random error (i.e. skipping a page). Therefore, the patient support subscale for this case was not included in the final analysis, but the organizational support subscale was, since all data were present for that scale. For the fourth case, three items were missing from the patient support subscale (38%), and two items from the organizational support subscale (25%), thus both subscales were excluded from the final analysis. However, in that case, the responses to the open ended questions were still included. Therefore data on the patient support subscale were reported for n=31 and for the organizational support subscale n=33.

#### **Reliability testing.**

To examine internal consistency reliability (Burns & Grove, 2009) of the PCRS scale, Cronbach's alpha coefficients were calculated for both subscales. The patient support subscale and the organizational support subscale had Cronbach's alpha coefficients of .93 and .88 respectively.

#### **Approach to analysis.**

##### ***Description of sample.***

First, the sample's characteristics were described using descriptive statistics. The following demographic variables: clinician role (profession), work place setting, members of the health care team, funding allocation, age range, and gender yielded categorical data which were reported using frequency and percentages (Burns & Grove, 2009).

Years of experience in diabetes education is a demographic variable that yielded continuous data. For this variable measures of central tendency (mean), and measures of dispersion (range and standard deviation) were reported (Burns & Grove, 2009).

***Research questions.***

Research question 1 (RQ1) related to the extent to which CDEs report they are delivering various components of DSMS. The data source to answer this question was gained from responses to the PCRS items. Total scores for both subscales were calculated, as well as scores for each individual item.

Both individual items and the sub-scales scores yielded continuous data and were examined using descriptive statistics, specifically measures of central tendency (mean, median and mode) and measures of dispersion (range and standard deviation). Because the sample consisted of those who completed the study package at the meeting, and those who completed the study package elsewhere (i.e. at home), mean subscale scores for each group were compared, and the results are reported in Table 1. Since no differences in the characteristics of the two groups of participants were observed the data for the groups were combined and findings were reported for the entire sample.

Table 1

*Mean Subscale Scores by Group*

Location	Patient Support (n=31)	Organizational Support (n=33)
Meeting	49.5 (n=12)	44.9 (n=14)
Home	50.6 (n=19)	46.4 (n=19)

The second research question (RQ2) focused on uncovering what supports and barriers CDEs perceived are present in community based settings that affect the delivery of DSMS. Data to answer RQ2 came from participants' written responses to the the three open ended questions. Responses to each question were analyzed separately. The third question asked CDEs to comment on anything else that is important to know about their experiences delivering DSMS. Respondents used this question to list more barriers or supporting factors, therefore, responses to the third question were incorporated into their respective emerging themes. The participants' written responses to the open ended questions were examined using content analysis. Responses were analyzed based on conventional content analysis procedures (Hsieh & Shannon, 2005). The benefit of using conventional content analysis is that the categories stem from participant responses, rather than preconceived categories or theoretical perspectives (Hsieh & Shannon, 2005). In other words, conventional content analysis allows the researcher to formulate categories from responses of participants, rather than based on prior thoughts, research, theoretical, or anecdotal knowledge.

First, the researcher reviewed the written responses to the each of the questions separately and made notes of first impressions about potential categories. Similar responses were clustered into groups. Groups were assigned a category label based on words found in the participants' responses (Hsieh & Shannon, 2005). Data were organized inductively by organizing them from specific responses based on the text, into increasingly broad categories (Creswell, 2007).

The categorization scheme was reviewed by the thesis supervisor, a process known as peer debriefing. Peer debriefing is used to allow researchers to check the accuracy of research procedures with a colleague (Speziale & Carpenter, 2007). The researcher provided the thesis

supervisor with a working definition of each of the key categories from the three questions as well as examples of text that had been coded in that category. In this way, the supervisor examined the text and the respective category to ensure there was agreement between the researcher and the supervisor about the categorization scheme. This was an iterative process undertaken more than once until agreement was reached about the categorization scheme and the assignment of data to the respective categories.

The themes emerging from the categorization scheme were outlined and described narratively. The narrative description of each category was supported by specific responses from the text. The number of responses occurring in each category was tallied and the frequency with which a particular category occurred was reported. Participant responses to open ended questions were typically one to two word responses, lists, or point form answers, which limited the analysis of these data to a descriptive exploration only. Therefore these responses were not used for comparisons with participant demographic data or PCRS scores.

## **Chapter 5: Findings**

This chapter presents the findings of the study aimed at exploring the extent to which certified diabetes educators (CDEs) perceive they are delivering components of diabetes self management support (DSMS) in community based settings and the factors that affect DSMS delivery. The chapter begins with a description of the sample characteristics, followed by the results pertaining to the research questions.

### **Sample**

#### **Response rate.**

A total of fifty eight research packages were distributed, and thirty nine were returned for a response rate of 67%. Six study packages were excluded because respondents did not meet the study eligibility criteria. Specifically three respondents were not CDEs, and three respondents worked in hospital based settings. Thus the final sample size was 33. One respondent reported being a registered practical nurse (RPN) and was included in the study because she or he met all other eligibility criteria including being a registered member of the nursing profession. Fourteen participants (42%) completed the study at one of the meetings, and 19 participants (58%) completed the study at home.

#### **Demographic profile.**

The sample consisted of 16 (48.5%) registered nurses (RNs) and 17 (51.5%) registered dietitians (RDs). Selected demographic characteristics of the sample are presented in Table 2. The number of years as a CDE ranged from 0.5 to 25 years with a mean of 6.56 (SD=6.54). Most (n=15, 45%) participants were in the 30-49 age range. Most CDEs reported working in community health centers or family health teams. Other work place settings included

community mental health, diabetes specialty clinic, outreach program, private practice and regional coordination office. Respondents were asked to indicate the professionals with whom they worked within the diabetes care team. Respondents reported they work most frequently with RNs or RDs, social workers and pharmacists. Eight respondents indicated they worked with members of the health care team other than those listed on the demographic questionnaire, including kinesiologists (n=3), endocrinologists (n=1), internists (n=1), mental health workers (n=1) nurse practitioners (n=1), and recreation therapists (n=1). The majority of respondents (n=27, 81.8%) indicated the funding source of their diabetes program as the Diabetes Education Program from the Ministry of Health and Long Term Care.

Table 2

*Demographic profile of participants (n = 33)*

Characteristic	Frequency	Percentage
<b>Practice setting</b>		
Community health center	14	42.4
Family health team	11	33.3
Other	7	21.2
Single physician office	1	3
<b>Profession</b>		
RD	17	51.5
RN	16	48.5
<b>Age</b>		
18-29	8	24.2
30-49	15	45.5
50-69	10	30.3
<b>Members of the healthcare team *</b>		
Nurse	32	97
Dietitian	30	90.9
Physician	15	45.5
Social worker	15	45.5
Pharmacist	11	33.3
Other	8	24.2
Psychologist	2	6.1
<b>Funding</b>		
Diabetes Education Program	27	81.8
Other	4	12.1
Unknown	2	6.1

*\*Participants could select all categories that applied.*

## Findings Addressing Research Questions

### Primary care resources and supports.

The primary research aim was to explore the extent to which CDEs report they are delivering various components of DSMS, namely, assessment, goal setting, action planning, problem solving and follow up, measured by the PCRS study instrument. The scores on both

patient support and organizational support subscales are presented in Table 3. The actual range of scores for the patient support and the organizational support subscales was 16-76 and 9-71 respectively, suggesting a wide distribution of scores on both subscales. The mean score for the patient support subscale was 50 (SD = 14.21), while the mean score for the organizational support subscale was 45.8 (SD = 14.80). These means correspond to a quality level of “B”. Based on a possible highest score of 80 and the scoring description on the PCRS, the actual mean scores obtained in this study imply that on average participants reported that they were providing patient support, and had organizational supports present at the patient, provider and team level, but not at the systems level (Diabetes Initiative, 2006).

Table 3

*Descriptive statistics for PCRS subscales*

Sub Scales	Range of Scores						
	Possible	Actual	Median	Mean	Mode	SD	Skew
Patient Support (n=31)	8-80	16-76	50.19	50.20	47.00 <sup>a</sup>	14.21	-0.577
Organizational Support (n=33)	8-80	9-71	52.00	45.80	50.00	14.80	-0.419

*Note.* <sup>a</sup>Multiple modes exist. The smallest value is shown.

Descriptive statistics for individual items on the patient support subscale are reported in Table 4. The range of scores for each item was 1-10 and the item means ranged from 5.76 to 6.91. The item with the highest mean on this subscale was patient involvement, while the item with the lowest mean was patient assessment.

Table 4

*Descriptive statistical analysis of individual items on the patient support subscale (n=31)*

Item	Mean	Median	Mode	SD	Minimum	Maximum	Skew
Assessment	5.76	6.0	7	2.450	1	10	-0.054
SME <sup>a</sup>	6.58	7.0	8	1.969	2	10	-0.748
Goal / action planning	6.30	6.0	9	2.284	2	10	-0.331
Problem solving	6.24	7.0	7	1.786	2	10	-0.319
Emotional health	6.16	6.0	6 <sup>b</sup>	2.343	2	10	-0.216
Patient involvement	6.91	7.0	8	2.115	2	10	-0.523
Social Support	6.19	7.0	7	2.104	2	10	-0.456
Community resources	6.26	6.0	6	1.949	2	9	-0.533

*Note:* <sup>a</sup>SME=self management education. <sup>b</sup>Multiple modes exist. The smallest value is shown.

Descriptive statistics for items on the organizational support subscale are presented in Table 5. The range of scores for each item on the organizational support subscale was 1-10, which was similar to the possible range of scores. Item means ranged from 5.09 to 6.36. The item with the highest mean score was patient care team, and the item with the lowest mean score was quality improvement.

Table 5

*Descriptive statistical analysis of individual items on the organizational support subscale (n=33)*

	Mean	Median	Mode	SD	Minimum	Maximum	Skew
Continuity of Care	5.67	6.0	7	2.37	1	10	-0.462
Co-ordination of Referrals	5.84	6.0	6	2.31	1	10	-0.180
QI <sup>a</sup>	5.09	5.0	4 <sup>b</sup>	2.66	1	10	0.003
Documentation systems	6.02	6.0	9	2.76	1	10	-0.507
Patient input	5.39	6.0	6	2.22	1	9	-0.387
SMS <sup>c</sup> in primary care	5.55	6.0	4	2.02	1	10	-0.083
Patient care team	6.36	7.0	10	2.68	1	10	-0.281
Staff education & training	5.76	6.0	5 <sup>d</sup>	2.71	1	10	-0.271

*Note.* <sup>a</sup>QI=quality improvement. <sup>b</sup>Multiple modes exist. The smallest value is shown. <sup>c</sup>SMS= Self management support. <sup>d</sup>Multiple modes exist. The smallest value is shown.

### **Facilitators and barriers to DSMS.**

The second research question addressed the factors CDEs view as facilitating or inhibiting the delivery of DSMS in community based settings. The next section presents the factors that CDEs reported as enhancing their ability to deliver DSMS followed by the factors reported as inhibiting their ability to deliver DSMS, as categorized by the researcher.

#### *Supports - factors enhancing the delivery of DSMS.*

The most frequently reported factors that enhanced the delivery of DSMS were team based care, individualizing DSMS, adequate time, CDE knowledge / experience / credentials, and the availability of resources.. Table 6 lists the factors that were described as enhancing the

delivery of DSMS and the frequency with which they were reported. Each is described in detail in the following section and illustrated with participant quotes.

Table 6

*Factors enhancing the delivery of DSMS (n=33)*

Factor	# of times reported
Team Based Care	23
Multidisciplinary approach to team based care	12
Organizational Support / infrastructure to support team based care	6
Physician support	3
Other	2
Individualizing DSMS	9
Adequate time	8
Availability of resources	8
CDE knowledge, experience, credentials	8
Care delivery and flexibility	7
System support	5
Availability of space	3
Continuing education and training	3
Patient self referral	2
Community partners	2
Other	6

*Team based care.*

The most prominent theme that emerged for factors that enhance the delivery of DSMS was team based care (n=23). Team based care included the following subcategories:

multidisciplinary approach to care, organizational support and infrastructure to support team approach, physician support, and other. The multidisciplinary approach to care included “having team combined appointments” such as with RDs and RDs; and having other accessible team members such as “chiropractors (n=2)”, “social workers” (n=3), “kinesiologists”. Respondents reported the multidisciplinary team approach was supportive and included “team cohesion and support”, “team / colleague support for learning, consult, and mentoring” and “team support”. Organizational support refers to infrastructure that supported team based care, such as the “employer”, “administrative support”, and “clerical support”.

The support of physicians in particular was also reported by some (n=3) as a facilitator of DSMS. One respondent indicated that “many physicians have embraced the team approach to diabetes care and like to practice collaboratively”. Other respondents described the support of physicians as “physician confidence”, and “physician availability to consult”.

Factors categorized as “other” in the team based care theme included “pharmaceutical representative support” and “volunteer support to do non patient related tasks i.e. preparing handouts, and providing refreshments for patients”.

#### *Individualizing DSMS.*

Another frequently reported theme was individualizing DSMS (n=9). One CDE’s comment captures this theme, namely the “primary aim at a visit is to meet the patients’ agenda”. Individualizing DSMS included “encouraging the client - any achievement at all”, “setting small goals”, “understanding cultural differences” and “identifying client interest”. One CDE described the need to support patients by “teaching the client that this is a process - ongoing, therefore [patients] need ongoing education and support”.

*Adequate Time.*

Having adequate time was frequently reported as a support to delivering DSMS (n=8). Time was reported as necessary for a variety of reasons such as to “develop a relationship (this takes time)”, “scheduling enough time to practice skills with patients”, and “time to deliver support adequately”.

*Availability of Resources.*

Another perceived support to DSMS delivery was the availability of resources (n=8). Respondents indicated a variety of supportive resources including those that support patients such as “language supports at no cost to the client”. Program resources were also mentioned, specifically the “availability of resources” such as “food models, books, handouts, meters, samples”, “funding”, and “pre-signed prescriptions for lancets and strips for patients”. One respondent also mentioned resources that help to engage patients, specifically, “tools like conversation maps that engage patients”.

*Knowledge / experience / credentials.*

CDEs in this study reported knowledge, experience and credentials of CDEs as factors that enhance DSMS delivery. CDEs highlighted the importance of having knowledge and skills in self management as illustrated in these quotes “knowledge regarding self management options” and “becoming skilled in motivational interviewing”. Another respondent referred to knowledge regarding the Stanford model, a model for patient self management: it is “important that facilitators in Stanford model are equipped with accurate knowledge about diabetes management”. In terms of credentials, CDEs reported “having your CDE certification gives family physicians more trust in a provider of DSMS” and described how the “autonomy

associated with [being a ] CDE opens the door to delivery of DSMS”. One respondent indicated “the fact that I am an RN and CDE gives credibility and knowledge”.

*Continuing education and training.*

While only three participants commented on continuing education and training as a support, it closely relates to knowledge, experience and credentials. Without the opportunity for continuing education and training, it is impossible for CDEs to acquire knowledge, develop skills and maintain credentials. Three respondents commented on continuing education and training, explaining that “continuing education opportunities”, “management support to facilitate training” and the “opportunity for continuing education for educators to continue to build skills” were factors that enhanced their perceived delivery of DSMS.

Other factors that were reported as supports for the delivery of DSMS less frequently, included care delivery and flexibility, system support, availability of space, patients’ ability to self refer for DSMS, having access to community partners, and other factors such as outreach opportunities.

***Barriers - Factors inhibiting the delivery of DSMS.***

This section describes the factors reported by CDEs as inhibiting the delivery of DSMS. They include patient related factors, physician related issues, staffing and scheduling, lack of funding, lack of team commitment to self management, and focusing on outcomes versus self management (see Table 7).

Table 7

*Factors inhibiting the delivery of DSMS (n=33)*

Factors	# of times reported
Patient factors	22
Psychological factors	6
Finances	6
Factors that inhibit learning	6
Not attending appointments	4
Physician related	11
Staffing and scheduling	9
Lack of funding	9
Lack of team commitment to self management	7
Inadequate educator training	6
Lack of time	6
Communication	5
Outcomes focused versus self management focus	5
Non-patient related activities	4
Lack of space	4
Lack of medical directives	3
Limited access to health care team members	3
Political factors	2
Other	8

*Patient related factors.*

The most commonly reported barrier in this study was patient related factors (n= 22). Patient factors were subcategorized as psychological factors, finances, factors that inhibit learning, clients not attending appointments, and other. Psychological factors were reported by six CDEs and included change management; “patients not willing to make changes” and “clients managing change”; “client motivation” and “apathy”; and “difficulty engaging patients in self management”.

Patient finances were also a barrier reported by some CDEs. One respondent indicated that “patients need adequate money and coverage for supplies “strips, lancets, diabetes medications, and insulin)”. Without financial assistance programs for patients such as “Ontario Disability Support Program [and] Ontario Drug Benefit, many patients are unable to afford supplies to effectively manage diabetes”. Another respondent noted that “financial barriers of clients make change behavior extremely difficult i.e. healthy diet, and no coverage for diabetes supplies”.

Six respondents described factors that inhibit patient learning. Some of these factors included “language barriers” (n=2), “low health literacy”, “social determinants of health”, “multicultural concerns” and “cognitive deficits”.

Patients’ non-attendance at appointments was identified as a patient related barrier. Three CDEs cited “no shows” as a barrier to the delivery of DSMS, and one respondent indicated that some patients do not show up for appointments because they “are unable to take time off work”.

*Physician related factors.*

Following patient related factors, the next most frequently reported barrier to the delivery of DSMS was physician related (n=11). Three respondents indicated that there is a “lack of physician support”. Respondents also indicated “doctors seem to forget about us” and “doctors make assumptions that their clients wouldn’t be interested in committing to 8 hours of education (four 2-hour classes)”. Another issue reported was a lack of team work between physicians and CDEs. One respondent indicated “some physicians tend to ‘do it themselves’ and don’t involve other members of the diabetes team or don’t refer to us”. “Poor physician communication” was also cited as a physician-related factor that inhibited DSMS delivery by some CDEs.

*Staffing and scheduling.*

The next most frequently reported theme was staffing and scheduling. Staffing issues included: “increased workload due to insufficient staffing and complex patients”, “lack of coordinator”, “differing employment status (i.e. employee of family health team versus consultant for family health team), and “staff roles - not allow[ing] RDs to do insulin starts”. Lack of staff was also reflected as “lack of people power to: find independent sponsors for events, help organize community education events, and advertis[ing] - spread information about planned events”. Scheduling issues included: “strict scheduling - mandatory 60 minute initial visit and 30 minute follow up”.

*Lack of Funding.*

Lack of funding was a barrier identified by CDEs (n=9) and included “budget constraints for resources, conferences and staff (i.e. outreach workers)” and “differing funding models”.

Differing funding models may be explained by limitations set by the Ministry of Health and Long Term Care (MOHLTC), such as being “only funded for type 2 diabetes and pre diabetes”. One respondent indicated that there were “unrealistic expectations from the MOHLTC (1000 new patients per year)”. Another funding issue was the pay scale for community employees. One respondent indicated that the “reduced pay scale results in fewer community experts and reduced knowledge”. Another respondent re-iterated this point, stating of “major concern are pay scales - new diabetes practitioners gain experience in the community and then take hospital jobs that pay \$10,000-20,000 more! This leaves the community with very few experts”.

*Lack of team commitment to self management.*

Lack of team commitment to self management was a theme identified by 7 respondents. One respondent summarized “it is difficult to practice self management if you are not supported by a culture that believes in it”. Similarly, another CDE stated “it is difficult to foster [DSMS] unless it is the focus”. One respondent indicated there are “team members with in the family health team who do not practice self management and therefore do not support your efforts”. Another respondent indicated that there are “co-workers who want control”.

*Inadequate educator training.*

As previously described, three respondents indicated that continuing education and training opportunities were a support to the delivery of DSMS. In contrast, lack of educator training was identified by six participants as a barrier to DSMS delivery. Respondents indicated that “self management training for educators is lacking” as well as a lack of “medical background regarding chronic disease”. Another respondent indicated that there are “not enough education days and not a lot of money for education and conferences”.

*Outcomes focus vs. self management focus.*

One additional barrier that was reported by CDEs was the perception that they were focusing on outcomes versus focusing on self management. More specifically, some CDEs perceive spending more time on clinical outcomes, such as metabolic measurements, rather than on dimensions of self management such as action planning or goal setting for example. These respondents indicated that the focus of care was on “numbers and targets vs. DSMS skills and follow up”. Similarly, one CDE wrote “our follow up appointments don’t count for stat[istics], only new clients count as stat[istics]”.

Less commonly reported barriers to DSMS delivery included lack of time, communication, non-patient related activities, lack of space, lack of medical directions, limited access to health care professionals, political factors and other issues such as absence of projects to enhance the programs.

Some factors were listed by some participants as enhancing DSMS, and by others as inhibiting DSMS. For example, respondents (n=7) reported that a lack of shared vision for the delivery of DSMS was an inhibiting factor, while others (n=8) reported shared vision as an enhancing factor for the delivery of DSMS. Similarly, time was reported (n=6) as an inhibiting factor, as well as an enhancing factor (n=9). This finding suggests that there are factors that, when present, enhance the delivery of DSMS, or when absent, inhibit the delivery of DSMS.

## **Chapter 6: Discussion**

### **Introduction**

This chapter discusses the research findings. It reviews the representativeness of the sample, and the results pertaining to each research question. It concludes with a summary of the key points of discussion.

### **Representativeness of the Sample**

This sample consisted of 16 registered nurses (RN) and 17 registered dietitians (RD), all of whom were certified diabetes educators (CDE). Most were middle aged adults with an average of 6.5 years of experience working as CDEs. The sample characteristics were difficult to compare to the profile of CDEs in Canada, and specifically in Ontario because demographic information of CDEs in the province is not recorded. Only the number of CDEs in Ontario is recorded and at the time of the study was approximately 1,200, working in both hospital and community settings. Thus, the extent to which the sample is representative of the target population in terms of age, years of experience as a CDE could not be ascertained.

The majority of participants worked in community health centers and family health teams. These settings are comparable to those outlined in the Ontario's Diabetes Strategy which include community health centers, family health teams, and other community organizations. In general, respondents indicated that the diabetes program in which they worked received "Diabetes Education Program" funding from the MOHLTC, which is consistent with the funding formula for community-based diabetes programs in Ontario.

## **Discussion of Key Findings**

The purpose of this study was to examine the extent to which CDEs report delivery of DSMS components, and the factors that influence its delivery. CDEs' responses to the PCRS suggested that on average, they implemented the components of DSMS at a "B" level. From a quality perspective, a "B" score represents a more comprehensive and consistent delivery of the dimensions of DSMS compared to a C or D level, but lacks a system wide integration of some elements of patient and/or organizational support (Diabetes Initiative, 2006). Thus, these findings suggest that overall CDEs perceive they are delivering DSMS in community based settings in an organized and consistent way at the team level, but may be lacking system wide implementation of an A level of quality. There were an equal number of barriers and supports to DSMS identified by participants, yet team based care was reported as a support to DSMS delivery with a high frequency. These results may help explain the B level quality and may also provide some insight into areas for improvement at a systems level necessary to obtain an A quality level.

## **Primary Care Resources and Supports Tool**

### **Patient supports subscale.**

This study was among the first to use the Primary Care Resources and Supports (PCRS) tool for research purposes. However, Brownson et al. (2007) developed the tool and used it with a group of health care teams in a quality improvement initiative. Therefore, findings from this study will be compared to that of Brownson et al.

In the original development and testing of the tool, the mean reported for the patient support subscale was 44.4 (SD=12.1) (Brownson et al., 2007) which was somewhat lower than the mean score reported in this study (50.2, SD=14.2). There are a few potential reasons for the difference in mean scores on the patient support subscale between this study and the initial testing (Brownson et al., 2007). First, in the initial testing, the PCRS tool was used with patients presenting with a variety of chronic disease such as diabetes, HIV, cystic fibrosis, pediatric obesity, depression and multiple sclerosis, whereas the present study only focused on diabetes. Some conditions might make certain dimensions of patient support more difficult to implement, which might account for a lower mean score in the previous study. For example, in a condition such as depression, it might be more difficult to engage patients in self management making DSMS more difficult to implement.

Second, this study only examined community based health care settings, while the previous study involved different settings such as academic medical centers, public health agencies, community health centers, independent provider associations, hospital based clinics, and federally qualified health centers (community based organizations) (Brownson et al., 2007). Brownson et al. may have obtained a lower mean score due to possible difficulty implementing some components of patient support in certain settings. For example, it might be more difficult to deliver self management education in acute hospital settings than in outpatient community settings because in an acute medical illness situation, patients might not see self management as their main priority. Because Brownson et al., did not examine each setting specifically, it is difficult to ascertain the extent to which individual components of patient support were being delivered in different settings.

Third, the sample characteristics may have differed between the present and previous studies. While this study focused on RNs and RDs who were CDEs, the previous study sample included individuals from 20 health care teams. Brownson et al. (2007) did not specify which health care professionals completed the study. This study focused on CDEs only because their main role is the delivery of DSMS, whereas SMS might not have been the main focus of other health care professionals' practice. Therefore, Brownson et al. may have had a lower score on the patient support subscale because some health care providers included in their study might not have had a specific self management support role.

The mean score on the patient support subscale obtained in this study suggests that on average, CDEs report they are implementing the DSMS components at a B level. While this is considered a positive score given the relative newness of DSMS delivery in community settings, CDEs reported a large number of patient related factors that may contribute to why an even higher score, representative of system wide integration, was not reported. Patient related issues included psychological factors, financial factors, factors that related to why patients might not attend appointments, and factors that inhibited patient learning. Psychological factors encompassed patients' ability to make changes and apathy toward self management, which might inhibit the CDEs ability to engage patients in other dimensions of patient support such as problem solving, goal setting or action planning. Financial factors included patients' inability to afford resources necessary for self management, such as medications or blood glucose testing strips. For that reason, patients may not be willing to set self management goals if financial resources inhibit them from achieving these goals (e.g. goals for monitoring blood glucose levels). One CDE suggested patients did not attend appointments because of inability to take

time off work. Patients' non-attendance at appointment precludes CDEs from implementing other components of DSMS such as follow up with patients. Factors identified by CDEs that affected patients' ability to learn, involved language and literacy problems. These factors were very similar to Rhee et al.'s (2005) study where they found poor vision, reading comprehension, and, hearing problems affected patients' level of self management.

***Individual patient support subscale item scores.***

While the mean scores for patient support differed between the present study and that of Brownson et al., (2007) the individual items on the patient support subscale with the highest and lowest score were the same in both studies.

***Patient involvement in decision making.***

In this study, the patient support item with the highest mean score was patient involvement in decision making. This finding is similar to the results of Brownson et al.'s (2007) finding, where patient involvement in decision making also received the highest mean score. Patient involvement in decision making is a philosophical perspective that might underpin practices of different healthcare professionals in different contexts. For example, Von Korff et al. (1997) postulate that collaborative management in chronic illness is necessary in every step of the decision making process and in the application of self-management support. It begins when patients and providers define problems clearly, identify the pressing concern with managing the illness, and develop a plan of action to promote self-management. Therefore, it is assumed that self management support is aimed at helping the patient to manage their diabetes, which requires their continuous input and collaboration. It is likely that patient involvement in

decision making received a high score because patient involvement underpins every aspect of providing DSMS.

*Individualized assessment of patients' self management needs.*

In this study, the item with the lowest score on the patient support subscale was individualized assessment of patients' self management needs defined as current knowledge and skills, learning style, health literacy level, patient preference, and resources available for self management (Diabetes Initiative, 2006). Brownson et al. (2007) also reported this item as having the lowest mean score. These authors suggested two explanations for this finding. First, assessment of individual self management needs requires time to complete, which is limited during primary care visits. While lack of time was reported as a barrier in the current study, no participants commented on lack of time with respect to individualized assessment of patients' self management needs. Second, according to Brownson et al., concise, validated tools are not available in primary care to assess individual patient self management needs. Lack of assessment tools was not identified as a barrier in the present study however, participants in this study may not know if tools exist for the individualized assessment of patients' self management needs. The Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada (CDA, 2008) provide flow sheets and checklists for assessment of metabolic control and even a screening tool for neuropathy. However, the guidelines do not provide any assessment tools to determine patients' self management needs, suggesting that the lack of tools for individualized assessment of patients' self management needs might be an issue in community settings, but was not identified in this study.

## **Organizational Supports Subscale**

### **Mean organizational subscale scores.**

In this study, the mean score for the organizational support subscale was 45.8 (SD=14.8), which was similar to the mean (45.9, SD=10.1) reported by Brownson et al. (2007). These scores represent a quality score of “B” which reflects implementation at a team based level, but lacks system wide integration. Due to the variation in settings between the present study and Brownson et al.’s it is surprising that these results are so similar; CDEs in this sample may not have had all the resources to support the implementation of DSMS because of the recent focus of DSMS in community settings. The similarities in these findings suggest that gaps exist in the organizational supports for CDEs regardless of setting.

The perceived barriers identified by CDEs in the present study may help to explain the B quality level and provide insight into areas for improvement. Some respondents indicated that they were working short staffed, or lacked the leadership of a program co-ordinator. In Crespo and Shrewsberry’s (2007) study, one of the key findings for the successful implementation of SMS was leadership. Thus, lack of leadership might have contributed to a lower score in this study because a leader might have been able to initiate some of the organizational supports such as training and education for staff, or quality improvement initiatives.

One respondent in the present study indicated that a barrier to DSMS delivery was a difference in staffing models between different diabetes programs. This respondent indicated

that there were staff who were permanent members of the family health team, and there were staff who worked as consultants for the family health team. Thus consultants were not available on a regular basis to facilitate implementation of DSMS. Similarly, working without sufficient staff members puts strain on the patient care team, another organizational support factor.

***Individual organizational support item scores.***

*Patient care team.*

While the mean scores for the organizational support subscale did not differ between the present study, and the previous study (Brownson et al., 2007), individual items receiving the highest score on the subscale differed between the two. The item with the highest mean score in the organizational support subscale, in this study, was patient care team (6.36). In comparison, Brownson et al. (2007) reported that patient care team received a mean score of 6.4, which although similar to the score obtained in the current research, was the item with the third highest score in their study.

Patient care team was conceptually defined on the PCRS to mean a multidisciplinary group of health professionals working together to manage patient care (Brownson et al, 2007). Participants in this study worked in settings where the infrastructure supported a multidisciplinary approach. The majority of respondents worked in community health centers, or family health teams, where the service delivery is expected to be team based. In fact, most respondents indicated they worked in a team with RNs and RDs, and frequently reported other members of the health care team were involved in the care of patients with diabetes as well (such as social workers, pharmacists, kinesiologists). Thus, it is expected that respondents scored the patient care team highly. Furthermore, the qualitative data in this study supported this finding

with 23 respondents indicating that team based care was a factor that enhanced their ability to deliver DSMS.

*Quality improvement.*

In this study, the item receiving the lowest score on the organizational support scale was quality improvement (5.09, SD = 2.7). While CDEs did not comment on quality improvement in the qualitative aspect of this study, there are some possible reasons why it received a low score. First, DSMS delivery in community based settings is relatively new. For that reason, the focus in community settings might have been to develop and implement DSMS programs. Because of the relative newness of DSMS in community settings, it may not yet be a priority to assess the current quality of DSMS with the goal of improvement. Therefore, a first step toward quality improvement initiatives, might be an assessment of the current level and quality of DSMS. It is possible that the newness of DSMS in community settings may account for the low score on this item. Quality improvement is an item that may require further study.

Conversely, ongoing quality improvement received the highest mean score (7.0, SD=1.8) in Brownson et al.'s study (2007), which may be explained by the context of that study. The sample was recruited from teams who were participating in a quality improvement initiative and therefore were expected to be engaged in quality improvement activities.

**Supports - Factors Enhancing the Delivery of DSMS.**

**Team based care.**

Findings from this study showed that the most commonly reported factor that enhances the delivery of DSMS is team based care. Family health teams, and community health centers are organizations where the care delivery is expected to be team based, and the notion of team

based care is integral to the Chronic Care Model (CCM) (ICIC, 2009). The CCM and the Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada (2008) outline team based care as a tenet of chronic illness care, describing health care providers as “prepared, proactive practice teams” (ICIC, 2009). Other chronic illness care literature highlights a team approach to care. Shetty and Brownson (2007) outline team based care as one of the eight organizational supports for self management. In Funnel et al.’s (2006) study, 50% of respondents indicated that the use of a team approach to care had a high level of influence on the provision of DSMS. Glasgow et al. (2003) also identified interventions to support chronic illness self management and described multidisciplinary teams as “one stop shopping” (p. 569) for self management support, indicating that team based care is also beneficial for patients because it is convenient. Therefore, the findings of this study are congruent with the literature which also highlights team based care as a support for CDEs in the delivery of DSMS.

Respondents in the current study explained how team based care was such a strong facilitator for the delivery of DSMS, specifically having the support of a multidisciplinary team. The team based approach to care was reported by CDEs as offering opportunities for collaboration, exchange of knowledge and the provision of assistance in their role of delivering DSMS. Relevant DSMS literature also outlines that team based care includes having clearly defined roles and responsibilities, open lines of communication, and the ability to work collaboratively and cohesively which promotes the most optimal level of patient care (Shetty & Brownson, 2007). Qualitative data in this study support the notion that team based care is a support for DSMS delivery.

### **Individualizing DSMS.**

Individualizing DSMS was another factor perceived as a facilitator of DSMS delivery. Respondents identified strategies they used to individualize their approach for different clients such as encouraging patients' success, setting small goals, identifying patient interest and teaching patients that self management is a process. Individualizing the approach to DSMS, and ultimately, making DSMS patient centered was a factor that CDEs described as enhancing their ability to deliver DSMS. These findings are consistent with the literature regarding SMS, which underscores the importance of individualizing DSMS, such as assisting the patient to set personally relevant goals, and making action plans based on the patients' needs (Brownson et al., 2007). It is likely that individualizing the approach to DSMS might explain, in part, the overall mean score on the patient support scale, as patient supports are all organized around a patient centered approach, for example, individualized assessment, patient self management education, goal setting, action planning, and patient involvement in decision making.

#### **CDE knowledge / experience / credentials.**

DSMS is a complex intervention, requiring CDEs to have adequate knowledge regarding self management and to acquire adequate skills for its delivery, such as motivational interviewing. CDEs who participated in this study felt that being a CDE in and of itself was a factor that enhanced their perceived ability to deliver DSMS. Respondents also suggested that being a CDE gave them a certain level of credibility and trust with physicians. These findings imply that respondents felt that the delivery of DSMS required advanced knowledge and skills. The knowledge and skills required of a CDE to deliver DSMS suggests that they require resources in place to facilitate knowledge and skill acquisition. In fact, staff training was reported as a support, and lack of educator training was reported as a barrier.

Other literature has also cited professional development opportunities as a support for CDEs (Funnel et al., 2006; Shetty & Brownson, 2007). In this study, staff training and education was also addressed on the organizational subscale on the PCRS tool, and received a low score indicating that CDEs in this study perceived that staff training and education was not fully supported by their organizations. The qualitative data in this case support the notion that knowledge and skill development might be a factor that enhances DSMS delivery, yet based on participant responses it does not appear to be well implemented in most settings.

### **Barriers - Factors Inhibiting the Delivery of DSMS.**

#### **Patient related factors.**

The most frequently reported factors that inhibit the delivery of DSMS pertained to patients. Twenty-two comments were made relating to various patient related factors perceived by CDEs as barriers to delivering DSMS. Patient factors were categorized into subcategories including psychological factors, finances, patients not attending appointments, factors that inhibited learning, and other factors.

Psychological factors included readiness for change and apathy which are themes found in other DSMS related literature. Sprauge et al. (1999) also found that educators believed some patients were in denial about having diabetes, and were not willing to make changes. Similarly, Gucciardi et al. (2008) found that apathy contributed to higher attrition rates in diabetes programs. Psychological factors were barriers commonly mentioned in this study and in previous literature which supports the idea that implementation of diabetes self management requires a certain level of patient motivation to change. Patients may need support to manage change and stay engaged in self management. However, these findings also suggest that the

psychological factors that impede patient self management might also affect the CDEs ability to deliver components of DSMS, such as on going follow up with patients.

Patient finances were also identified as a factor that inhibited patient self management, which is consistent with previous literature (Peyrot & Rubin, 2008; Sprague et al. 1999). Financial constraints may prevent patients from performing costly self-management recommendations such as eating a healthy diet, or monitoring blood glucose.

Factors that CDEs believed inhibited learning were exemplified as “language barriers”, “language barriers without access to an interpreter”, “low health literacy”, “multicultural concerns” and “cognitive deficits”. Other studies cited similar patient barriers to the use of DSMS such as problems with the English language (Rhee et a., 2005), and language and literacy problems (Peyrot & Rubin, 2008).

#### **Physician related factors.**

Previous literature reported differences in views regarding the delivery of DSMS between physicians and CDEs (Peyrot et al., 2009; Sprague et al., 1999). Specifically, some educators felt that physicians have a vital role in whether or not patients access and use DSMS services (Peyrot et al., 2009). Physicians, however, felt they did not have enough referral sources, and that patients in DSMS programs were being told things they did not agree with (Peyrot et al., 2009). While these views have not been extensively examined, they suggest a difference in the perceived level of support between physicians and CDEs

In the current study eleven responses identified physician related factors that CDEs perceived inhibited their ability to deliver DSMS. Two main areas were reported by CDEs; these were: lack of physician support and lack of collaboration from physicians with respect to DSMS.

Physician support is clearly important to the delivery of DSMS as perceived by respondents in this study. Registered nurses in Reddy et al.'s (2011) study also reported that gaining support from physicians was an important part of establishing and implementing a diabetes program in a community setting. Physicians are part of the health care team for patients with diabetes, and for that reason their support and collaboration are important to facilitate implementation of DSMS. When physician support and collaboration are not present, CDEs may feel their delivery of DSMS is not valued; this perceived lack of support and value might inhibit CDEs from collaborating with physicians, influencing team based care, a central tenet of DSMS.

#### **Staffing and scheduling.**

Staffing and scheduling was the next most frequently reported barrier and included issues with workload, limited staff roles, and lack of staff to support community and outreach events. This finding is congruent with previous barriers outlined by CDEs namely lack of internal support (funding, staffing and materials) (Sprague et al., 1999).

#### **Lack of funding.**

Lack of funding was reported by a number of CDEs in the study. The most frequently reported funding concerns were regarding salaries for CDEs in the community, and funding issues related to diabetes program funding. Given that 27 (81.8%) of respondents indicated that they had "Diabetes Education Program" funding, which is dedicated funding for diabetes programs in the community, this finding was not necessarily expected. However, these funding constraints may have been perceived / reported by respondents who worked in settings, such as physician offices, who may not have dedicated "Diabetes Education Program" funding. For

example, in some settings, CDEs may work at a family physician's office but they are not working at a Diabetes Education Program.

Funding constraints were also described by respondents in relation to salaries for staff in community settings, compared to hospital settings. These concerns are likely due to differences in funding between hospital and community diabetes programs. Funding for community based diabetes education programs is typically called "Diabetes Education Programs" and is received from the Ministry of Health and Long Term Care, whereas hospital based diabetes education programs are typically known as "Diabetes Education Centers" and funding often comes in part from the MOHLTC and in part from global hospital budgets (K.B., personal communication, March 24, 2012). Therefore, hospital based programs have access to additional funds, through hospital global budgets, which might result in higher pay scales and differing benefit packages for staff members.

#### **Lack of team commitment to self management.**

Some CDEs reported a lack of team commitment to self management as a barrier to the delivery of DSMS, and this finding might give insight into why scores on the patient support and organizational support subscales were reflective of a "B" level of implementation. It may be difficult to deliver DSMS if the entire team involved in the process is not committed to the same approach. Many dimensions of patient support in DSMS rely on a shared vision or commitment to self management. For example, when a patient sets a self management goal it is presumed that each member of the health care team (nurse, dietitian, physician) will follow up with the patient on the progress of the goal, and assist the patient with any further action planning or problem solving related to meeting that goal. Self management support is a philosophical

perspective, that if not embraced by each team member, becomes difficult to deliver. Overall, patient care teams was the most frequently reported as a support for DSMS delivery in the qualitative data, and was the organizational item receiving the highest score on the PCRS; these findings suggest that overall teams are functioning well together. However, one example of why some teams might not be functioning well together might be related to a lack of team commitment to self management.

### **Outcomes focus versus self management focus.**

Respondents indicated that the goal of some diabetes programs is to meet “numbers and targets” such as glycosylated hemoglobin, waist circumference and blood pressure for example, rather than focusing on self management goals. While metabolic targets are important, the purpose of self management support is to support the patient’s goals. These observations suggest that if CDEs are feeling pressured to have patients meet certain targets it becomes difficult for them to assist patients to set individual self management goals. While a patient’s goal might be to reach a certain glycosylated hemoglobin level, patient’s might also have other self management goals such as testing blood glucose more than once a week, which may not be a goal or target of the program. It has been suggested that one of the reasons health care providers focus on metabolic measures is that they more structural than some dimensions of DSMS and are thus easier to implement and evaluate than other elements such as goal setting (Brownson et al., 2007).

A small number of respondents indicated that there was a need to meet statistical targets in terms of the number of patient visits per year. Typically a diabetes program is funded for one full time RN and one full time RD for 1000 new patients per year (M.O., personal

communication, September 15, 2011). Quarterly and yearly statistics regarding patient visits are required by the Ministry of Health and Long Term Care. Thus, if programs must meet a statistical target of 1000 new patients per year, it might not be possible for them to follow up with existing patients, because there is not enough time. Thus, feeling pressure to meet metabolic and statistical targets required for funding might inhibit CDEs from assisting patients to set and meet their own self management goals.

### **Summary**

This chapter has discussed the key quantitative and qualitative findings. Overall, the results indicate that CDEs in community based settings are reporting the delivery of DSMS at the “B” level. A “B” score reflects implementation of DSMS at the team level which can be interpreted as a positive finding given the recent change in setting for DSMS delivery in Ontario. The perceived supports identified by participants, such as multidisciplinary teams, individualizing DSMS, adequate time and CDE knowledge / experience / credentials may account for this score. On the other hand, an “A” quality level, which reflects a systems wide implementation and integration of SMS may not have been reached due to some barriers that were reported, such as patient related factors, staffing and scheduling, lack of funding and lack of team commitment to self management.

## **Chapter 7: Summary, Implications, Conclusions**

### **Summary**

In Ontario, chronic illness care, such as diabetes care, is undergoing a major shift. Not only is the setting changing from hospitals to community organizations, but the philosophical perspective of chronic illness care is changing from provider centered to patient centered and is now known as patient self management. The complex set of interventions that certified diabetes educators (CDEs) provide for patients is known as diabetes self management support (DSMS).

DSMS consists of individualized assessment of patients' self management needs, goal setting, problem solving, action planning and follow up. These five components describe how CDEs provide DSMS for patients. In contrast, organizational resources and supports are those factors that are in place within health care settings that support the CDE in delivering DSMS.

The extent to which DSMS is being delivered has not been previously explored in a Canadian context. This study is among the first to examine the extent to which CDEs perceive they are able to deliver DSMS and the factors that enhance and inhibit CDEs in their role of providing DSMS.

A convenience sample of 33 CDEs was recruited from multiple chapters of the Canadian Diabetes Association Educator Sections in Ontario. A standardized instrument, the Primary Care Resources and Supports (PCRS) (ICIC, 2006) tool measured the study variables, specifically patient support and organizational support. Three open ended questions were used to gather qualitative data related to factors that influence implementation of DSMS.

Descriptive statistics were used to characterize the sample and to examine the extent to which the components of DSMS were being implemented. Content analysis was used to

categorize qualitative data on factors that enhanced and inhibited the delivery of DSMS. The sample consisted of registered nurses (RNs) (48.5%) and registered dietitians (RDs) (51.5%), with an average of 6.5 years of experience as a CDE. Most CDEs worked in community health centers.

CDEs reported patient support and organizational support being delivered at a B level, which reflects an integration of delivery of DSMS at the microsystem, or individual practice level. While a “B” score does not represent system wide implementation of DSMS, including the health care system, policies, and environmental or community supports, this level of DSMS delivery is promising based on the short time that CDEs have been delivering DSMS in community based settings in Ontario. The supports identified by participants likely contributed to their reported ability to deliver DSMS at this level. The most frequently reported supports that enhanced the delivery of DSMS were team based care, individualizing the approach to DSMS for patients, adequate time, and CDE knowledge / experience / credentials. On the other hand, it is reasonable to expect that the barriers reported in the current study prevented a more comprehensive level of DSMS implementation. The most common barriers to the delivery of DSMS were: patient related factors, physician related factors, staffing and scheduling issues, lack of funding, and lack of team commitment to self management.

## **Study Limitations**

### **Sample.**

There are a number of limitations inherent in the study which should be taken into consideration when interpreting the results. While the sample size was small (n=33), and considered appropriate for exploratory studies (Burns & Grove, 2009), there is the potential for

selection and response bias with small samples. Voluntary participation in the study could have resulted in self selection, whereby the sample is made up of those who are more comfortable responding to questions concerning their own practice as a CDE. In addition, self report questionnaires assume that participants will respond to the questionnaire honestly; however, participants may provide socially desirable answers (i.e. higher scores), which could be a potential limitation because it might affect the study results in a positive direction. In order to minimize the potential threat of response bias, anonymity of the participants was maintained to ensure that they could not be identified by their responses and therefore should have felt free to answer honestly.

This study targeted potential participants who were members of Diabetes Educator Sections, and may not be representative of all CDEs in Ontario. This study specifically targeted a sample CDEs who were RNs and RDs. Given that other professional groups (i.e. pharmacists) may also be CDEs these findings may not apply to these professional groups. However, the findings of this study may be generalizable mainly to CDEs who are RNs and RDs in Ontario and members of interest groups such as the Diabetes Educator Section.

#### **Setting of study completion.**

In this study, participants had the option of completing questionnaires either at the meeting, or at home. The use of these “natural” uncontrolled settings was meant to offer time for participants to make a decision about enrolling in the study. However, the uncontrolled nature of these settings could have increased the threat of random error in the responses due to environmental factors or extraneous variables (Burns & Grove, 2009). For that reason, the mean scores of those who completed the study at the meetings and those who completed the study at

home were compared. There was no difference in mean scores between the two groups, suggesting that the setting of completion did not affect the scores.

## **Implications**

Despite these limitations, this study is among the first to explore perspectives of CDEs on the delivery of DSMS in community based diabetes programs in Ontario and Canada. Thus, the findings provide initial evidence with some implications for practice, research, theory, and policy.

### **Implications for practice.**

The shift in diabetes care from hospital settings to community based settings occurred in 2008 when the Ontario Diabetes Strategy was implemented, and in many cases the strategy was implemented in phases. Data collection for this study took place three years after the change in diabetes care delivery. This study is therefore the first known, to explore the delivery of DSMS since the shift to community based settings and findings can serve as a baseline for future exploration. While the findings suggest components of DSMS that CDEs report as being delivered relatively well such as patient involvement in decision making; CDEs also reported that barriers affected DSMS implementation.

### **Implications for service delivery.**

Findings from the study reveal a number of perceived barriers to the delivery of DSMS in community based settings that may have implications for practice. The item on the patient support subscale that was reportedly implemented with the least level of integration was individual assessment of patients' self management needs. Given that the qualitative data uncovered numerous patient related barriers affecting DSMS delivery, it is important that an

individualized assessment of patients' needs is conducted with greater consistency. Efforts are required to institute consistent assessment of patients' self management needs and barriers. Through the assessment of patients' needs, the CDE might uncover barriers and be able to assist the patient in strategizing to overcome to the barriers. For example, if health literacy is a factor affecting patients' ability to learn, an individualized assessment might uncover this barrier. In this way, the barrier can be dealt with before it further inhibits DSMS. Brownson et al., (2007) suggest that there are few validated tools with which to assess patients' self management needs. In the absence of these tools, CDEs can refer to the Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada (CDA, 2008) which outline that self management support interventions should be based on an assessment of the type of diabetes, level of glycemic control, treatment recommendations, learning ability, health literacy, ability to change, resources available, and level of motivation. Thus, in order to improve delivery of DSMS, a first step could be a more thorough assessment of the patients' needs and perceived barriers.

CDEs responses also reflected an overall "B" score on the organizational supports subscale. While CDEs in some organizations may have organizational infrastructure to assist them in the delivery of DSMS, these supports were not present at a system wide level in this sample. Ongoing quality improvement initiatives were the organizational item receiving the lowest score in this study. The use of quality improvement initiatives might help teams to address areas of DSMS that could benefit from improvement. One quality improvement strategy might be a patient satisfaction survey, which can gather patient input into the services received in order to obtain patient perceptions on the quality and delivery of DSMS services. Patient

satisfaction surveys might uncover some areas of DSMS that could be improved. This is one strategy that would increase the opportunity for patient input, which is also a dimension of organizational support.

Another quality improvement initiative might address the fidelity of the delivery of DSMS. Fidelity is concerned with the consistency of how an intervention is delivered in comparison to how it was intended (Dumas et al., 2001). While this study examined CDEs perceptions of DSMS delivery, it did not specifically address fidelity. The fidelity of DSMS could be measured by chart audits to assess the actual delivery of each dimension of DSMS. Since the CCM is a framework intended to guide the delivery of complex, chronic conditions, such as diabetes, it could be used as a benchmark to guide such quality improvement strategies.

Another organizational factor that hindered DSMS delivery was reported as staffing and scheduling problems. These findings imply that organizations need to address staffing problems possibly through a recruitment and retention strategy with a focus on retaining staff members, or replacing them in a timely manner that does not disrupt patient care services.

#### **Implications for team based care.**

While a multidisciplinary, team based approach to care was viewed as a facilitator, interprofessional relationship conflicts were seen as a barrier to DSMS delivery. Findings of this study and others suggest that organizations should support, both formally and informally, interprofessional collaboration and commit to a philosophy of self-management to build strong interprofessional teams. Increasing the opportunity for communication among professionals, such as team building activities, may help to clarify problems, and contribute to a deeper level of collaboration. For instance, teams within organizations might benefit from collaboratively

developing and committing to a shared vision and approach to diabetes support that is based in self management principles. A clear and explicit shared vision for self management might also help each provider to focus on and emphasize individual patients' self management goals at each encounter (i.e. dietitians can reinforce patients' goals that were set when the patient met with the physician). Teams might also increase collaboration and support by providing clear descriptions for their role in DSMS implementation. Team building activities, creating a shared vision for self management and clarifying roles might also help to resolve conflicts in interdisciplinary relationships and promote a stronger team environment.

### **Implications for research.**

This study used a self report questionnaire, specifically the PCRS, to obtain data about the extent to which CDEs report delivering the various components of DSMS and the extent to which organizational supports are in place to facilitate DSMS delivery. This was the first known use of the PCRS for research purposes. Given that the tool demonstrated a good level of internal consistency reliability, it appears appropriate for future use in research examining the delivery of DSMS.

Future research should replicate the study with larger sample sizes and to assess barriers and facilitators of DSMS in order to quantify their relationships with the implementation of DSMS components. For example, future research might examine relationships between demographic characteristics, such as years of experience as a CDE, and DSMS delivery. A validated tool could not be found to quantify the supports and barriers of DSMS, therefore, future research might focus on developing such a tool. Barriers and supports found in this study and others might be used to guide the development of a future research tool.

To broaden applicability of the findings to all CDEs, future research should also include CDEs from other professional groups such as pharmacists. In addition future studies might examine differences among subgroups of CDEs in the perceived ability to deliver DSMS, and their reported barriers and supports.

In addition, future studies may examine differences in the implementation of DSMS among community based organizations, such as differences between family health teams and community health centers, and between community based organizations and hospital based organizations to uncover inherent barriers. Given the differences in staffing and funding models in these settings, there may be differences between these groups. Identifying the differences among these groups may help to minimize them and increase the extent to which DSMS is being delivered in all settings across Ontario.

Finally, just as the CCM could be used to guide quality improvement initiatives, it could also be used to guide fidelity intervention research. Examining CDEs perspectives of the extent of DSMS delivery is an initial step toward future fidelity intervention research that actually measures DSMS delivery.

### **Implications for theory.**

While this study is not the first to use the Chronic Care Model as a lens to explore chronic illness care, prior research has suggested that self management support is one aspect of the CCM that is implemented with less frequency than other components of the model. It has been said that self management support is a difficult part of chronic illness care that requires a deeper examination (Brownson et al., 2007). To that end, this study aimed to explore self management support in terms of its delivery, barriers, and supports to give a deeper

understanding of why self management support is difficult and less frequently implemented as compared with other components of chronic illness care.

The Chronic Care Model (CCM) outlines the collaboration between patients and providers as “productive interactions” (ICIC, 2006, The Chronic Care Model). Results of this study showed that CDEs perceive patient related issues such as psychological factors like apathy, unwillingness to change, and low levels of motivation can impede the productive interactions between CDEs and patients. These factors might impact the patients’ willingness to engage in conversation regarding self management. Collaboration is necessary between patients and providers in order to successfully deliver DSMS. For example, one component of DSMS is problem solving. Both the patient and a provider take an active role in problem solving, as the patient identifies the problem in self management of diabetes, and the provider assists the patient in coming up with potential strategies to overcome the problem. For that purpose, the patient must be engaged in the process, and the provider must be dedicated to practicing a patient self management approach, that is, meeting the agenda of the patient, rather than that of the provider.

Because the CCM outlines chronic illness care it can serve as a guide for teams when delivering self management support. As suggested above, the CCM can be used as a framework to guide quality improvement initiatives. The CCM outlines dimensions of DSMS, and quality improvement initiatives could use the dimensions of DSMS outlined in the CCM as a benchmark for program evaluation. The CCM could also be used as a framework to structure diabetes self management programs. While not evaluated in this study, the CCM contains elements other than self management support which can help to structure diabetes programs such as resources and policies and clinical information systems(ICIC, 2006). Because the CCM outlines collaborative

practice between patients and care providers, it could also be used as a guide for developing shared visions for self management.

### **Implications for policy.**

CDEs in this study reported various funding issues. One of the funding issues highlighted was the discrepancy between the amount of funding available for a variety of resources, such as conferences, program resources, staff members, and salaries. In Ontario, there are a variety of ways a diabetes program receives funding. For example, the Local Health Integration Network (LHIN) distributes global hospital funding, which in turn supplies hospital based diabetes programs with funding, however, the LHINs also provide funding to community health centers (Ontario LHIN, 2006). The Northern Diabetes Health Network (NDHN) distributes funding for Ontario pediatric diabetes programs, northern Ontario Aboriginal diabetes programs (but not southern Ontario aboriginal diabetes programs), and northern Ontario diabetes programs (but not southern Ontario diabetes programs) (NDHN, 2004). Third, the Ministry of Health and Long Term Care provides direct funding for community based diabetes education programs, such as those in family health teams. While ultimately all funding comes from the provincial government, there is an obvious lack of a centralized system that provides funding and ensures equitable resources for all Ontario diabetes programs, which may result in major discrepancies among funding and staffing structures. Therefore, policy makers might advocate for a centralized system as a possible approach to reduce discrepancies in funding allocation.

### **Conclusion**

Diabetes self management support is a health intervention focused on assisting patients with the self management of their diabetes. It has shown improvements in patients' quality of life

and health outcomes. Examining the extent to which CDEs report being able to deliver DSMS and the extent to which organizational supports are in place to facilitate such delivery is important because it may affect the intended, beneficial outcomes of DSMS. Exploration of the factors that enhance or inhibit DSMS delivery is also useful in providing a deeper understanding of DSMS delivery, from the perspective of those delivering the intervention. This study is among the first to provide an exploration of DSMS from the perspective of CDEs working in community organizations in Canada.

Overall, CDEs reported delivering DSMS at a B level which reflected consistent and organized delivery at a team based level with respect to patient supports such as assessment, goal setting, action planning, problem solving, and organizational supports in community settings. A number of barriers to DSMS delivery were revealed: patient related factors, physician related factors, staffing and scheduling, lack of funding, and the lack of team commitment to the principles of self management. Factors that enhanced CDEs' perceived ability to deliver DSMS were: utilizing a team based approach to care, individualizing the approach to self management for each patient, adequate time, and CDE knowledge, experience and credentials. Collectively, the study findings suggest that DSMS is being delivered at the team level, but lacks system wide integration. While this finding is positive, some barriers exist that may prevent a more consistent and more effective delivery of DSMS. Similarly, organizational supports appear to be in place to support CDEs in some organizations but they may not be present province wide. The number of reported barriers implies that DSMS is a difficult intervention to deliver and requires the commitment and engagement of the patient, the provider, the organization, and the government who provides resources for care delivery.

## Appendix A - Consent Information: Face to Face Version

Dear Certified Diabetes Educator,

You are invited to participate in a research study that examines the extent to which certified diabetes educators report being able to deliver diabetes self management support in community settings. The secondary purpose of the study is to identify factors that enhance or inhibit the delivery of diabetes self management support, as reported by certified diabetes educators. This study is being conducted by Evelyn Haalstra as part of her educational requirements for the Master of Nursing Degree at Ryerson University. The thesis supervisor is Dr. Heather Beanlands from the Daphne Cockwell School of Nursing at Ryerson University.

If you chose to participate in the study you will be asked to complete the study package inclusive of the Demographic Information Questionnaire, the Primary Care Resources and Supports Tool and three open ended questions. There will not be any way to link your responses to you, as your name will not be on the Demographic Information Questionnaire, the Primary Care Resources and Supports Tool or the open ended questions.

**To that end, please do not include any information that may identify you on any part of the study package.**

The completion of the three tools is anticipated to take approximately 15 minutes. Once completed, you are asked to return these forms in the envelope provided into the designated box provided at the Diabetes Educator Section Meeting labelled “Certified Diabetes Educator Study”. Because responses are anonymous, there is no way to withdraw your responses once the evaluations have been received. Data will be collected to show how many study packages were circulated and how many were returned completed. The researcher will have no way to know if you have completed the study package or not.

Participation in this study is completely voluntary and you may chose not to participate. Should you chose not to respond, you are asked to place the blank copy of the study package in the designated drop box as well. Non-participation will in no way affect your future relationship or interactions with any person involved in the study or with Ryerson University or the Diabetes Educators Section of the Canadian Diabetes Association. If you chose to participate you may elect to answer some or all of the questions in the study package. You may leave any question unanswered.

Responses will be kept in a locked file cabinet for five years and then destroyed by process of shredding. Access to your responses is restricted to only the research team. The findings of the study will be shared at health conferences, or in relevant professional health journals but only grouped responses will be used.

The investigators do not know of any harm that may arise from participating in this study. Participation in this study may help the researchers to understand the perspectives of certified diabetes educators regarding factors that influence their delivery of diabetes self management support to patients in community settings. This knowledge might ultimately help to develop strategies to support diabetes educators in delivering diabetes self management support in the community.

If you would like to participate in the study please fill out the enclosed Demographic Information Questionnaire, the Primary Care Resources and Supports Tool, and complete the three open ended questions and place the complete package into the envelope provided, seal, and place into the designated drop box.

**Consent to participate in the study is implied by returning the study package.**

If you require any more information or have any questions, please contact Evelyn Haalstra at [evelyn.haalstra@ryerson.ca](mailto:evelyn.haalstra@ryerson.ca) or Dr. Heather Beanlands, Associate Professor, Program Director - Master of Nursing; Daphne Cockwell School of Nursing, Ryerson University 416-979-5000 ext. 7972.

If you have any questions regarding your rights as a study participant please contact the Research Ethics Board at Ryerson University at [rebchair@ryerson.ca](mailto:rebchair@ryerson.ca)  
Nancy Walton, PhD Chair, Research Ethics Board, Associate Professor  
Ryerson University 416-979-5000 ext 6300

Thank you for considering the invitation to participate in this study.

Sincerely,  
Evelyn Haalstra, RN, CDE, MN(c).

## Appendix B - Consent Information - Mailed Version

Dear Certified Diabetes Educator,

You are invited to participate in a research study that examines the extent to which certified diabetes educators report being able to deliver diabetes self management support in community settings. The secondary purpose of the study is to identify factors that enhance or inhibit the delivery of diabetes self management support, as reported by certified diabetes educators. This study is being conducted by Evelyn Haalstra as part of her educational requirements for the Master of Nursing Degree at Ryerson University. The thesis supervisor is Dr. Heather Beanlands from the Daphne Cockwell School of Nursing at Ryerson University.

If you chose to participate in the study you will be asked to complete the study package inclusive of the Demographic Information Questionnaire, the Primary Care Resources and Supports Tool and three open ended questions. There will not be any way to link your responses to you, as your name will not be on the Demographic Information Questionnaire, the Primary Care Resources and Supports Tool or the open ended questions.

**To that end, please do not include any information that may identify you on any part of the study package.**

The completion of the three tools is anticipated to take approximately 15 minutes. Once completed, you are asked to return these forms in the postage paid, pre-addressed envelope and place it into the nearest mailbox. Because responses are anonymous, there is no way to withdraw your responses once the evaluations have been received.

Participation in this study is completely voluntary and you may chose not to participate. Should you chose not to respond, you are asked to return the incomplete study package in the postage paid, pre-addressed envelope and place it in the nearest mailbox. Non-participation will in no way affect your future relationship or interactions with any person involved in the study or with Ryerson University or the Diabetes Educators Section of the Canadian Diabetes Association. If you chose to participate you may elect to answer some or all of the questions in the study package. You may leave any question unanswered.

Responses will be kept in a locked file cabinet for five years and then destroyed by process of shredding. Access to your responses is restricted to only the research team. The findings of the study will be shared at health conferences, or in relevant professional health journals but only grouped responses will be used.

The investigators do not know of any harm that may arise from participating in this study. Participation in this study may help the researchers to understand the perspectives of certified diabetes educators regarding factors that influence their delivery of diabetes self management

support to patients in community settings. This knowledge might ultimately help to develop strategies to support diabetes educators in delivering diabetes self management support in the community.

If you would like to participate in the study please fill out the enclosed Demographic Information Questionnaire, the Primary Care Resources and Supports Tool, and the three open ended questions and place them into the postage paid, pre-addressed envelope.

**Consent to participate in the study is implied by mailing back the study package.**

If you require any more information or have any questions, please contact Evelyn Haalstra at [evelyn.haalstra@ryerson.ca](mailto:evelyn.haalstra@ryerson.ca) or Dr. Heather Beanlands, Associate Professor, Program Director - Master of Nursing; Daphne Cockwell School of Nursing, Ryerson University 416-979-5000 ext. 7972.

If you have any questions regarding your rights as a study participant please contact the Research Ethics Board at Ryerson University at [rebchair@ryerson.ca](mailto:rebchair@ryerson.ca)  
Nancy Walton, PhD Chair, Research Ethics Board, Associate Professor  
Ryerson University 416-979-5000 ext 6300

Thank you for considering the invitation to participate in this study.

Sincerely,  
Evelyn Haalstra, RN, CDE, MN(c).

Appendix C - Demographic Information Questionnaire

**DEMOGRAPHIC INFORMATION QUESTIONNAIRE**

1. Are you a certified diabetes educator?

Yes

No - if no, we thank you for your time, but you do not meet the study eligibility criteria. Please do not continue with the study and return your blank questionnaires in the box labeled "Certified Diabetes Educator Study"

2. In what setting do you currently practice?

single physician office

family health team

community health center

other: \_\_\_\_\_

(If you work in acute care, we thank you for your time, but you do not meet the study eligibility criteria. Please do not continue with the study and return your blank questionnaires in the box labeled "Certified Diabetes Educator Study")

3. What is your profession

Registered Nurse

Registered Dietitian

4. How many years have you been a diabetes educator? \_\_\_\_\_ years.

5. Please indicate your age range.

18-29

30-49

50-69

70+

6. Please indicate all of the professionals, including yourself, who are involved in your diabetes program, and provide direct patient services (Check all that apply).

Dietitian

Nurse

Pharmacist

Social Worker

Psychologist

Physician

Other: \_\_\_\_\_

5. Please indicate how the diabetes program you work for is funded.

Diabetes Education Program (DEP) funding from the Ministry of Health and Long Term Care

Other source of funding: \_\_\_\_\_

Unknown

## Appendix D - Recruitment Email

### Email for Chair Persons

*Please disseminate this email to all members of the Diabetes Educator Section on your email list-serve at your earliest convenience.*

Email Subject Line: Invitation to Participate in a Research Study.

If you are a certified diabetes educator who is a registered nurse, or a registered dietitian working in a community based setting (such as a doctor's office, a family health team, a community health center, or another community health care organization) you are invited to participate in a research study.

The purpose of the study is to examine the extent to which certified diabetes educators report being able to deliver diabetes self management support in community settings. The secondary purpose of the study is to identify factors that enhance or inhibit the delivery of diabetes self management support, as reported by certified diabetes educators.

The study involves completing a questionnaire that will take approximately 15 minutes and asks questions about the extent to which CDEs feel they are able to implement different dimensions of diabetes self management support with patients (such as goal setting).

This study is being conducted by Evelyn Haalstra as part of her educational requirements for the Master of Nursing Degree at Ryerson University.

If you would like more information or are interested in participating in the study you may contact the researcher by email at [evelyn.haalstra@ryerson.ca](mailto:evelyn.haalstra@ryerson.ca). The researcher will mail you a copy of the study package, including the consent form and study questionnaire, as well as a postage paid, pre-addressed envelope for you to return the study should you choose to participate.

I thank you for your consideration of this invitation to participate in this research study.

Sincerely,

DES CHAIR PERSON

## Appendix E - Follow up Email for Chair Persons

### Followup Email for Chair Persons

Email Subject Line: Its not too late to participate in the research study

In follow up to the DES meeting held on May 18, 2011, there is still an opportunity to participate in the research study by sending in the study packages.

If you chose to participate, simply mail the study back to the researcher in the postage paid self addressed envelope that was provided at the DES meeting.

If you have chosen not to participate, you may send the blank copy of the study package back to the researcher in the postage paid, self addressed envelope that was provided to you.

If you are a certified diabetes educator who is a registered nurse, or a registered dietitian working in a community based setting (such as a doctor's office, a family health team, a community health center, or another community health care organization) there is still an opportunity to participate in a research study.

If you were unable to attend the DES meeting and would like more information or are interested in participating in the study you may contact the researcher by email at [evelyn.haalstra@ryerson.ca](mailto:evelyn.haalstra@ryerson.ca). The researcher will mail you a copy of the study package, as well as a postage paid, pre-addressed envelope for you to return the study.

**Participation in this study is voluntary.**

I thank you for your consideration to participate in this research study.

Sincerely,

Evelyn Haalstra  
Master of Nursing Candidate  
Ryerson University

## Appendix F - Follow Up Email for Individuals

### Followup Email for Individuals

Email Subject Line: Its not too late to participate in a research study

If you are a certified diabetes educator who is a registered nurse, or a registered dietitian working in a community based setting (such as a doctor's office, a family health team, a community health center, or another community health care organization) there is still an opportunity to participate in the research study being conducted by Evelyn Haalstra.

The study purpose is to examine the extent to which certified diabetes educators report being able to deliver diabetes self management support in community settings and to identify factors that enhance or inhibit the delivery of diabetes self management support.

Participation in this study is voluntary. If you chose to participate, simply mail the study back to the researcher in the postage paid self addressed envelope that was provided by mail.

If you have chosen not to participate, you may send the blank copy of the study package back to the researcher in the postage paid, self addressed envelope that was provided to you.

If you would like more information or are interested in participating in the study you may contact the researcher by email at [evelyn.haalstra@ryerson.ca](mailto:evelyn.haalstra@ryerson.ca).

I thank you for your consideration to participate in this research study.

Sincerely,

Evelyn Haalstra  
Master of Nursing Candidate  
Ryerson University

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