

**CULTURAL SENSITIVITY IN DIABETIC INTERVENTIONS AMONG AFRICAN AND  
CARIBBEAN IMMIGRANTS IN CANADA: A SYSTEMATIC REVIEW**

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## **ABSTRACT**

Type 2 diabetes mellitus (T2DM) continues to be a national challenge for Canadians. African and Caribbean Immigrants are among the most affected groups and those at risk of developing comorbidities and related complications. It continues to prove challenging to treat T2DM for the affected individuals. Effectively treating the disease can help mitigate risk factors for related comorbidities and complications while improving the quality of life for those affected. There is increasing research, outside of Canada, showing the evidence for the effectiveness of culturally sensitive and adapted interventions to immigrant patients affected with T2DM. In light of the effectiveness of such interventions in many industrialized nations, a systematic review (SR) can offer the best evidence for the scope and consideration of such treatment approaches in Canada. This SR aimed to determine whether community-based diabetic interventions in Canada, are culturally sensitive to African and Caribbean minorities living with type II diabetes. A narrative synthesis was employed to report the effect of interventions seeking to affect outcomes of T2DM patients in Canada. Of the 63 articles included for full review, 60 were excluded for not meeting the criteria of having the target population explicitly identified and also not having any mention of cultural sensitivity. Three articles were included for the final review because the target population was explicitly identified. The final results showed that all interventions were found not to be culturally sensitive to African and Caribbean T2DM patients in Canada. Our results suggest a lack in Canadian literature. To the best of our knowledge, this is the very first systematic review on this subject matter in Canada. This review provides dependable information and recommendations to researchers, educators, clinicians, and policy makers for future research with T2DM African and Caribbean patients in Canada.

**Keywords:** Type 2 diabetes, Interventions, Cultural sensitivity, Narrative synthesis, Systematic review.

## RÉSUMÉ

Le diabète de type 2 demeure un défi national pour les Canadiens. Les immigrants d'origine d'Afrique et des Caraïbes sont parmi les groupes les plus frappés et l'un des plus à risque de développer des troubles comorbides et de complications liées au diabète. Traiter le diabète continue à poser un défi chez les personnes affectées. Traiter efficacement cette maladie peut contribuer à réduire des principaux facteurs de risque quant aux troubles comorbides et complications, tout en améliorant la qualité de vie chez les personnes affectées. Un nombre grandissant de recherche, hors du Canada, démontrent avec des preuves concluantes que les interventions sensibles et culturellement adaptées aux immigrants affectés par le diabète sont efficaces. Étant donné l'efficacité de ces interventions dans nombreux pays industrialisés, une revue systématique peut nous offrir la meilleure preuve pour l'envergure relative à ce genre de traitement au Canada. La présente étude méthodique vise à déterminer si les interventions contre le diabète, en milieu communautaires au Canada, sont culturellement adaptées aux minorités ethniques d'origines d'Afrique et des Caraïbes souffrant de diabète de type II. Une synthèse narrative a été utilisée afin de signaler les effets des interventions par rapport aux résultats des patients souffrant du diabète de type 2. Parmi les 63 articles considérés pour une évaluation complète, 60 ont été exclus car ni la population cible ou la mention de la sensibilité culturelle n'a été explicitement identifiée. Trois articles ont été inclus pour l'évaluation finale car la population cible fut explicitement identifiée. Aucune des interventions n'est culturellement sensible aux patients Africains et Caribéen affecté par le diabète de type 2. Nos résultats démontrent un écart dans la littérature Canadienne. A ce que nous sachons, cette revue systématique est la première qui touche à cette question au Canada. Cette revue fournie des données fiables et recommandations qui permettront aux chercheurs, enseignants, cliniciens, et aux décideurs en matière de politiques de santé pour des recherches futures auprès des patients Africains et Caribéen souffrants du diabète de type 2 au Canada.

**Mots-clés:** Diabète du Type 2, Interventions, Sensibilité culturelle, Synthèse narrative, revue systématique.

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## **ABBREVIATIONS**

**ADA: American Diabetes Association**

**CDA: Canadian Diabetes Association**

**CVD: Cardiovascular disease**

**DPA: Dorsalis Pedis Artery**

**GI: Glycemic index**

**GL: Glycemic load**

**HC: Health Canada**

**DFU: Diabetes Foot Ulcerations**

**HbA1c: Glycated haemoglobin**

**MeSH: Medical Subject Headings**

**PA: Physical Activities**

**PHAC: Public Health Agency of Canada**

**PTAP: Posterior Tibial Artery Pulses**

**PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses**

**PROSPERO: International Prospective register of systematic reviews**

**DQOL: Diabetes Quality of life**

**RCT: Randomized Controlled Trial**

**SR: Systematic Review**

**SB: Sedentary Behaviour**

**TAC: Thesis Advisory Committee**

**T2DM: Type 2 Diabetes Mellitus**

# Chapter 1: Introduction

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## I. The growing burden of type II diabetes mellitus: Global and national outlook

Diabetes continues to be a challenge worldwide considering that the number of people affected by the disease has gone from 108 million to 422 million between 1980 and 2014 (WHO, 2016). Globally, the prevalence of diabetes has risen to 8.5% from 4.7% for the same period (WHO, 2016). Type 2 diabetes mellitus, also referred to as T2DM, is a growing concern for Canadians and continues to be on the rise across the country while new immigrants are among groups who continue to be at high risk of developing the disease (Booth et al., 2013; Creatore et al., 2010).

As of 2010, nearly 2.7 million people lived with the disease. That number is expected to almost double by the year 2020. The prevalence of diabetes mellitus (DM), in North America has is expected to climb to over 12% by the year 2030 per reliable estimates. This is a jump from the more than 10% that has been estimated thus far (Shaw et al., 2010). The rise in incidence affects Canada as well. This is significant considering the fact that the cost of diabetes to the Canadian healthcare system and economy is expected to climb to \$16 billion from \$11.7 billion calculated in 2010 (CDA, 2016). This issue also affects many immigrants living in Canada. The vast majority of them, leaving Africa and the Caribbean, come to Canada for a better quality of life, and

a more prosperous, healthy future. Early research suggests that the health of many immigrants deteriorates with time after having migrated to Canada (McDonald et al., 2005). Immigrants of African and Caribbean ancestry are among those estimated to be at elevated risk for diabetes (Creatore et al., 2012). The province of Ontario alone, which has more people than any other province in Canada, notes the disparity in rates. People of African ancestry (blacks) are said to have diabetes prevalence rates of 11.6% compared to their white counterparts at 7.3% (Shah, 2008). The increase in incidence and prevalence of diabetes among this subgroup is not new. It can be argued that many immigrants coming to Canada arrive from developing countries where the prevalence of diabetes is already high (Creatore et al., 2010). The same researchers also suggest that prevalence, within this subgroup, increases since their arrival to Canada compared to Canadian-born citizens (Creatore et al., 2010). It is noted by the same researchers that immigrants from Latin America and the Caribbean who come to Ontario, also have a high prevalence rate of 9.8% vis-à-vis the rate of 5.2% for long-term residents and those who have recently emigrated from industrialized nations to Canada (Creatore et al., 2010).

This can also be attributed to many social factors, experiences and behaviours that can influence health. Social determinants of health include, among others, employment, education, literacy, income, social support networks, and health services, among many (PHAC, 2011).

## II. The Role and Background of the Researcher

I am originally from the Democratic Republic of Congo and emigrated from there with my family in 1990. I had the opportunity to experience the challenges, albeit to a smaller scale than adults, associated with being an immigrant. I also have a mixed educational background in Bioethics, French literature (including postcolonial discourse), religion and health sciences from the University of Toronto. I feel that, my interdisciplinary education now at the University of Ottawa complements my previous academic experience and gives me an array of tools that will be necessary for this interdisciplinary study. I am fully bilingual in French and English, a skill that will prove crucial in reviewing research articles in either language. The University of Ottawa is providing me a unique opportunity to do research in both languages while greatly contributing to the health of Canadians and immigrants. Being a member of a visible minority group that is at a greater risk of developing diabetes, this issue is of immense importance and compels me to seek evidence on what is being done to help those who have developed the disease manage it well. I had the privilege of participating in Focus groups on nutrition for diabetics at the Centre Francophone de Toronto (CFT). I also volunteered there and am still volunteering at the Montfort hospital in Ottawa visiting and helping patients from every background with various needs. At the CFT, I surveyed patients for a total of 30 hours on different days, in order to establish quality of care received and areas of improvement. I had the privilege of talking with many Afro-Caribbean immigrant patients about their expectations and challenges associated with living in Canada as visible minorities. The time spent volunteering at the CFT gave me an opportunity to observe, and understand some of the many challenges faced by

patients from diverse ethnic backgrounds. I also worked as an intern in 2015 with the Conference Board of Canada where I reviewed many articles, dealing with prevention of metabolic disorders in children through increasing physical activity and reducing sedentary behaviour, including: randomized control trials, systematic reviews and meta-analyses and helping synthesize many of them into briefings and recommendations for particular health needs in Canada.

### **III. Diabetes pathophysiology and challenges with health care accessibility**

Diabetes mellitus is a serious health condition. “It is a set of diseases characterized by the body's inability to produce insulin (type 1 diabetes) or to effectively use the insulin that it does produce (type 2, or 'adult onset' diabetes) (Guyton, 2006). A person with diabetes often develops hyperglycemia; otherwise known as high blood glucose. Persistent hyperglycemia may lead to long-term damage to the heart, kidneys, eyes, nervous system, gastrointestinal system, and amputations (Coban et al., 2004; Fan et al., 2014). Diabetes is generally classified into four types: type 1 (a) and (b), type 2, other types, and gestational diabetes. Type 1 diabetes is an autoimmune condition due to specific destruction of pancreatic beta cells by T cells. After a patient is determined to have lost 75% of pancreatic islets, clinical manifestation of diabetes is apparent (Husseiny et al., 2012). There are two potential defects in people with type 2 diabetes. They have impaired insulin secretion and insulin resistance. Impaired insulin secretion is the rarer of the two. It is known that both environmental and genetic factors contribute to both insulin resistance and insulin secretion. In terms of insulin resistance, obesity is the main factor that contributes it in people with type 2 diabetes. Obese people generally tend to have a higher insulin resistance due to insulin cell receptor

dysfunction in which case target cells for insulin become unresponsive (Stienstra et al., 2011). T2DM continues to be a growing concern for African and Caribbean populations in Canada.

As of 2013, the WHO estimates that more than 370 million people have diabetes in the world (WHO, 2016). As already seen, the number of people with diabetes is increasing in every country including Canada. Access to health care can be challenging for such populations as we shall consider in our research. Researchers suggest that the causes of diabetes may have genetic, physiological, psychological, familial, social, economic, cultural, and political aspects (Candib, 2007). For instance, events that occur during foetal development and maternal factors may influence whether someone develops diabetes later in life. Genetic factors, such as predisposition, play a role. Social factors such as nutritional change to eating higher calorie and fat foods, urbanization, immigration, and cultural perceptions of what it means to be overweight or obese may also have an effect (Candib, 2007). It is also suggested that economic factors such as changes in the cost and availability of food in certain areas can also play a role in the development of diabetes (Candib, 2007). It is of necessity that community and other relevant government agencies work separately and in conjunction with one another, in order to address some of the broader issues that affect these populations (Amibor et al., 2012). As seen previously, the risk of developing diabetes, for African and Caribbean immigrants, increases with time since immigration, suggesting that acculturation and transition to a "westernized" diet and lifestyle contributes to the problem of diabetes among this population (Creatore et al., 2010). T2DM is widely treated with the use of insulin for glycemic control. It is noted that for

many ethnic populations, certain barriers can have an impact to these patients starting and adhering to this particular treatment (Visram, 2013). Of such are barriers such as language, needle phobia, social stigma, and religious beliefs (Visram, 2013).

It is to be noted that a “westernized” diet does not constitute the main dietary consumption of these immigrants. Most eat as they did in their country of origin but adopt a Canadian diet as adjunct to what they are already eating, hence adding culinary excitement to their *joie de vivre* in Canada while adopting a sedentary lifestyle especially in the cold seasons. Indeed, health care accessibility can be rendered difficult by discrimination as well. Canada is known to have a strong universal health care policy. Nevertheless, researchers argue that visible minority groups do not always have equal access to health care and have more unmet needs than non-racialized groups (Hyman, 2009; Hyman et al., 2014).

The Canadian federal government reported that mental health, for instance, is also associated with social issues such as racism and discrimination when it comes to visible minorities (Government of Canada, 2006). Studies have suggested that newcomers are also found to have less regular visits with a doctor compared to non-recent immigrants and Canadian born individuals (Hyman, 2009). A study by Quan et al. (2006) found that visible minorities are less likely to be admitted to hospitals (Quan et al., 2006). The many challenges pertaining to accessibility to health care services, especially those that were created to maintain and promote health, are correlated with the negative health outcomes of immigrants over time (Hyman, 2009). Visible minorities also experience higher rates of poverty, thereby a poorer health outcome (Rodney et al., 2009).

#### **IV. Canada: Multiculturalism and cultural sensitivity**

Canada is increasingly becoming a multicultural society where individuals identify with a particular racial and ethnic identity. Multiculturalism refers to the integration of many ethnic groups without the premise that a particular group is less or more important than the other. Based on this account, culturally sensitive interventions can be said to be implicitly multicultural (Lidburg et al., 2004). It remains alarming that ethnic minorities continue to be at the higher end of the spectrum of those affected by the disease (Griffiths et al., 2005).

It becomes axiomatic that diabetes interventions adapt a cultural sensitive approach in treating, educating, and helping ethnic minorities. Cultural sensitivity pertains to the extent to which ethnicity, cultural characteristics, experiences, behavioral norms, and belief systems of a target are integrated in the design, delivery, and evaluation of interventions (Resnikov et al., 1999; Papadopoulos et al., 2004).

Immigrant diabetic patients approach health care with health beliefs shaped in part by their respective cultures (Hjelm et al., 2005). A qualitative study with immigrants in Ontario revealed that beliefs about diabetes revolved around multiple factors. Food preparation and preference are very much part of cultural preservation. Culture determined how much they ate and exercised. Adapting beliefs and cultural practice to intervention becomes crucial to developing the best practice guidelines (Cooper Brathwaite et al., 2016).

Culture itself is defined as a socially constructed environment which pertains to a set of meanings that a group in time and place come to adopt in order to facilitate social coordination (Oyserman, 2017). Effective interventions and care ought to integrate vital particulars of culture into personal patient care and diabetes education programs targeting ethnically diverse societies (Papadopoulos et al., 2004).

#### **V. Diversity within African and Caribbean Canadians and postcolonial discourse**

African and Caribbean immigrants, in Canada, are themselves a diverse group. They are often subject to societal pressure when moving to Canada. Many of them are also in a situation whereby they suffer a twofold disadvantage. Those for whom English is not the primary language are linguistically dominated by English, and are part of a visible minority; (Laperrière, 2013) a position that can put them at a disadvantage in terms of health care accessibility. This is especially pertinent because research suggests that adaptation and integration, known sources of stress and internal conflict, can lead to a position of vulnerability (KalangawaTshisekedi, 2008; Povlsen et al., 2005). Vulnerability may give rise to all sorts of health triggers. For instance, Francophone men and women, living in Ontario, are more likely to report being in poorer health than Anglophones and Allophones. Despite the fact that Canada's largest city Toronto is a multicultural city, francophone Torontonians are still a minority (Chambon et al., 2001; OFA, 2011). In order to achieve a comprehensive health care capable of servicing all Torontonians more effectively, a conscientious effort and solidarity from multiple parties will need to be established (Bélanger et al., 2011; Bouchard, 2011). In Sub-Saharan Africa alone, researchers have established the fact that many countries are known to share similar yet different ways of life. They each

have diverse cultures within their borders and speak a variety of languages and dialects apart from French, English, and Arabic.

The common reality is that they are all subject to acculturation when moving to Canada. This is true of African and Caribbean immigrants in general. As far as acculturation is concerned, “it has been suggested by some that immigrants often adopt a ‘Canadian lifestyle’ that includes negative habits such as smoking, drinking alcohol, unhealthy eating, and an increase in sedentary activities” (Dean et al., 2010).

## **VI. Post colonialism and discrimination in research**

In light of postcolonial analysis by Fanon, (1952) the Afro-Caribbean immigrant, upon arrival to Canada, wants to affirm himself by trying to adapt and conform to *the Canadian way of life*<sup>45</sup> (Fanon, 1952; *italics’ mine*). Before immigrating to Canada, African and Caribbean immigrants have certain perceptions of the Western world. This world represents the ideals to which civilize society must aspire to. The common consensus, among many of my peers from Africa and the Caribbean, is that Canada is talked about as a place of opportunity and ease of life.

Colonialism and slavery have reshaped African and Caribbean peoples and their worldviews. The effects of colonialism can be seen in the way they perceive themselves. For many, the white man represents the ideal while going to his country represents advancement. In Africa, for instance, development is often understood from a Eurocentric point of view. This stems from the colonial era when “those exploiting a territory by dominating a local majority have attempted to transform non-European areas into fundamentally European constructs (Mudimbe, 1988). You are not developed

or educated unless it is done from the perspective of Western nations. This is not to say that the people of Africa and the Caribbean only understand themselves from this point of view. Certain things such as culture greatly influence their understanding of themselves as well as disease.

Culture influences behavior and ultimately has an impact on overall health. Nevertheless, the Postcolonial African and Caribbean self-perception is greatly influenced by the European. Colonialism basically confused what was working well in terms of culture and belief systems in most African Traditions (Mudimbe, 1988). For many, illness is understood from a spiritual stance. They may attribute certain diseases to gods or spirits. Death is certainly taboo because the world of the spirit is revered and feared. The advent of Christianity, through European missionaries, accentuated taboos. It brought about a new culture whereby death became something to be feared with an almost twisted reverence (Césaire, 1955; Mudimbe, 1988). Dying is not something the Afro-Caribbean man or woman contemplates the same way as the Canadian. Diabetes is no exception. Many view it as a disease that may lead to death, hence taboo; perhaps a little less than HIV/AIDS (Roberts et al., 2009). To be told that a certain disease has the potential to end one's life if not treated properly is indeed frightening for the African and Caribbean peoples.

A clear analysis of recorded interviews, of African Canadians in Alberta, showed that emotions are affected by the lack of awareness thereby impeding primary and secondary preventions among some African Canadian patients. In this study, patients divulged their intense emotions including the fear and shock they experienced when

they received their first diagnosis of T2DM. Additional resources had to come into play for them to start adhering to treatment (Ekong et al., 2013).

Considering postcolonial discourse, the issue of research and interventions can be clearly understood in terms of power relationships between whites and minority populations across many academic disciplines. Researchers continue to mention the fact that Academia is still a largely European construct. For instance, it is known that significant works of many African scholars remain outside “the canon of referenced literature” (Behrens, 2017).

Researchers have pointed to the fact that it is commonplace for many racial minorities to not fully adhere or participate in health care services (Williams, 2001). This can be attributed to a general lack of interest in understanding and incorporating culture in health care approaches to minorities. The same researchers suggest that health and research framework harbours intrinsic theoretical, epistemological, and ideological issues embedded in preserving the actual framework of Eurocentric privilege (Williams, 2001). Considering the analysis by Williams (2001), *diabetes research and interventions, in Canada*, ought to increasingly commit to the kind of approach that defies the hegemony of Eurocentric medicine and white privilege, *potentially improving the outcome for African and Caribbean diabetes patients*<sup>110</sup>(Williams, 2001; *italics’ mine*).

As part of their findings on the exclusion and inclusion of non-white ethnic minority groups in 72 North American and European cardiovascular cohort studies, researchers found that many North American studies considered the issue of ethnicity

and race, largely in respect to the sample rather than the racial/ethnic make-up of the population in research (Ranganathan, 2006) , further ignoring culture. Since decision makers rely heavily on research outcomes, they too may not consider culture either. This may further leave out minorities where research and interventions are funded.

## **VII. Putting research into practice**

Effective diabetes treatments require a combination of therapies and approaches in addition to medication. As will be detailed in the Discussion section, many high-quality researchers, in other countries, have demonstrated the effectiveness of adapting diabetes treatment to the culture of minorities. Nevertheless, it is not well known if such interventions are having much of an impact in Canada, especially since immigrants continue to be greatly affected with T2DM. It becomes expedient to synthesize the accessible evidence on T2DM interventions and analyze whether they are sensitive to our study population.

The lack of cultural sensitivity will be analyzed using a postcolonial discourse framework. Such an endeavour would help identify the gaps and pave the way for a more robust effort in research while affecting practice and improving the quality of life for those affected. By culture sensitivity, we emphasize the need for interventions to take certain cultural factors into consideration. Factors such as language, beliefs, nutrition preference fit the description. For instance, researchers can include bilingual interventionists or translators, have a discussion on cultural taboos where disease is concerned, and provide cultural appropriate information on nutrition and physical activity.

## Chapter 2: Methodology

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### I. Rationale for the systematic review

The diabetic population, among African and Caribbean immigrants, is increasing along with all the different diabetes comorbidities that make it difficult to manage the disease. It is ever so important to employ an effective approach in treating this chronic disease to improve QOL and reduce death rates in people living with diabetes.

Nevertheless, current guidelines for treating diabetes lack in their integration of cultural aspects as a vital part of intervention, despite the increased evidence-based research pertaining to this issue (Joo, 2014).

There is a gap in the literature when it comes to the cultural sensitivity of interventions and health services to African and Caribbean immigrants living with T2DM in Canada. More evidence from a systematic review- to show the effectiveness of cultural sensitivity- is needed to inform approaches to existing prevention, education, professional clinical practice and policy decision making in the fight against diabetes.

This systematic review is essential for many valid reasons. There is a lack in literature where the health needs of African and Caribbean diabetic patients are not integrated enough to improve the prevention, treatment, and management of diabetes

(Hyman, 2009). Indeed the current literature greatly focuses on susceptibility from a statistical background mainly from diverse quantitative studies.

This study focused on synthesizing existing and high quality evidence-based research and offers an in-depth narrative synthesis on the effectiveness of incorporating cultural sensitivity into existing community and clinically-based interventions in improving objectively measured outcomes, while improving how the African and Caribbean immigrant experiences and manages diabetes in Canada. A narrative synthesis is quite often sufficient even though it is usually encouraged to consider whether the data are appropriate for a meta-analysis. Even so, a systematic review does not necessarily demand a meta-analysis (Boland et al., 2014). The review provides an explanation that justifies the use of a narrative synthesis versus that of a meta-analysis. The narrative synthesis was conducted by adapting increasingly employed techniques (Boland et al., 2014; Popay et al., 2006; Rodgers et al., 2009).

It was essential that this research be undertaken with the use of a systematic review. Despite the fact that a qualitative research can bring about an understanding and make it possible to explain interaction with participating informants, (Guest et al., 2013; Laperrière, 2013) a systematic review puts me in control of my learning objectives and project. Research participants are to a qualitative study what the literature is to a systematic review. I greatly learned from a variety of different research methodologies. I gained some insights into the strengths and limitations of published research.

This systematic review employed explicit scientific methods to identify, select, appraise, and summarize similar but separate research studies. My research team

(TAC) and thesis supervisors are made up of experts in qualitative and quantitative research. This research employed a very transparent and replicable process of doing a systematic review.

The challenging task of doing a systematic review remains in making sense of large bodies of evidence drawn research databases using scientific methods and maintaining the integrity of the synthesis procedure. Even so, that the systematic reviews must be reliable is of utmost importance for community organizations, health service providers, researchers, educators, and policy makers.

This systematic review facilitates efficient integration of information for rational decision making. It provides a clear, transparent, and documented process. The transparent process helped minimize the bias and systematic errors in summarizing evidence.

I initially started this study as a qualitative research but was faced with many challenges of which some follow:

- Challenges associated with recruiting African and Caribbean participants in Toronto. Many of them, older, view disease as taboo. Because of culture, older folks think of it as disrespectful for a younger person to ask them questions about their private lives.
- Distance from Ottawa to Toronto made it challenging especially that it involved much long distance driving and spending much money to that end.

## **II. Main objective**

This systematic review did not primarily seek to assess the effectiveness of T2DM interventions. The purpose of this systematic review was to determine whether community-based diabetic interventions in Canada, are culturally sensitive to African and Caribbean minorities living with T2DM, in light of how cultural sensitive approaches to diabetes interventions has proven effective to improve objectively measured outcomes and quality of life for minority diabetic patients in other industrialized nations.

This was done through a comprehensive exploration of community health intervention, dealing specifically with health promotion and prevention. A thorough analysis was done using cultural sensitivity, and postcolonial lenses. The latter was employed to understand power relationship between whites and non-whites when it comes to health research and interventions.

This study contribute to literature by providing valuable information to community organizations, health service providers, researchers, educators, and policy makers, to better understand how to approach the issue of diabetes when dealing with the aforementioned subgroup.

## **III. Hypothesis**

We hypothesized that type 2 diabetes interventions in Canada are not widely culturally sensitive to African and Caribbean diabetic patients. This could be due to bias,

non-consideration of the sub-population, decision makers' bias influenced by researchers. It could also be due to difficulties in reaching and recruiting this group.

The overall hypothesis of this review is that diabetes interventions in Canada may not be culturally sensitive to African and Caribbean patients. Hence, addressing this gap may lead to greater sensitivity.

*PROSPERO*: This review has been registered with the PROSPERO Centre for Reviews and Dissemination and made public on the database on February 14 2017 (ID number: CRD42017056952).

#### **IV. Research question**

This systematic review was guided by the following research question:

Are community-based diabetes interventions culturally sensitive to African and Caribbean minorities living with type II diabetes in Canada?

## V. Inclusion and exclusion criteria

Eligibility criteria were determined in terms of PICo and not PICO (Boland et al., 2014). PICo encapsulates: population, phenomena of interest [that can be either a condition or an intervention] and the context (Joanna Briggs Institute, 2011 as quoted in Boland et al., 2014, P. 146). Criteria specific to PICo are detailed in table 1.

Table 1. PICo

Review question	Are community-based diabetes interventions culturally sensitive to African and Caribbean minorities living with type II diabetes in Canada?
P	African and Caribbean patients living diagnosed with T2DM
I	Experimental and quasi-experimental interventions
Co	Outpatient/Community health settings in Canada

## **1. Inclusion criteria**

1. All published and unpublished studies, including experimental, randomized controlled trials (RCTs) and quasi experimental studies describing the prevalence of type 2 diabetes mellitus.
2. Type 2 diabetes interventions in Canada only.
3. Population-based studies of type 2 diabetes community interventions with a clear outcome assessment.
4. Articles published between the years 2010-2016, in either French or English, with full English and French abstracts will be eligible for inclusion where adult African or Caribbean, diagnosed with type II diabetes, are explicitly part of a representative sample.

## **2. Exclusion criteria**

1. All Studies which combine type I and type II diabetes participants, or that do not clearly target type II diabetes were not included.
2. All studies which sought to assess the effectiveness of medications
3. Studies that do not include a representative sample of ethnic minorities from Africa and the Caribbean, aged 18 years or older.

4. Articles including narrative reviews, opinion pieces, letters or any other publications not showing evidence of primary data and/or explicit method descriptions.
5. In case of duplicate publications of the same study, published in more than one research and publication journal, the most exhaustive and recent version was employed.
6. All studies with low-quality scores in terms of bias risk assessment were not included.

### **3. Inclusion selection of studies:**

Complete articles that are identified by the search were retrieved for synthesis so long as they met the inclusion criteria. Initial identification was done based on title and abstract. After a rigorous application of the criteria based on titles and abstracts, research studies were either: Included, excluded or marked as 'pending' if their inclusion was debatable until articles were then further taken into the review of full texts. Strict inclusion/exclusion criteria were then is applied after full texts were assessed. A second reviewer was asked to evaluate full texts of excluded articles in light of inclusion/exclusion criteria and divergence between both reviewers were resolved by face to face meeting before articles were finally selected for inclusion. Tables/flow charts were produced to map out the process.

#### **4. Methods and analyses**

The methodology described in “Doing a Systematic Review: A student’s guide (Boland et al., 2014), were employed to guide this review. This review was conducted, for the most part, with one reviewer. A second individual reviewed all excluded/included full-text articles to ensure that they met the expectations of the inclusion criteria. Experts affirm that data can be synthesized narratively or through a meta-analysis. Data were narratively synthesized by presenting results employing words and referencing them in tables (Boland et al., 2014; Cochrane Collaboration, 2008; Quan et al, 2006; Rodgers et al., 2009).

#### **5. Criteria for studies to be included in this systematic review**

Studies had to specifically adhere to the following criteria in order to be included in the review: 1) study designs, 2) type of intervention, 3) characteristics of participants, 4) outcome assessment.

#### **VI. Types of studies**

This review included studies encompassing: experimental studies including randomized controlled trials (RCTs), and quasi-experimental studies from 2010 to 2016. Studies that did not adhere to the inclusion criteria, not reported in French or English were excluded. Studies involving an individual patient case report and those that could not be retrieved but only had available abstracts were also excluded.

The gargantuan repository of information required some professional help. We endeavoured to meet with an information and expert librarian at the University of Ottawa's Health Science library. Mrs. K. Fournier proved to be an invaluable help as we met a few times, in 2016, since our initial screening meeting in September of 2016. The initial search in Grey literature yielded no relevant studies. It became evident that only published research articles would be the object of our research.

### **1. Participants' characteristics**

The target population was adult African or Caribbean immigrants living in Canada, already diagnosed with type 2 diabetes. Participants could also represent a sample or part of a sample population in trials.

### **2. Type of intervention**

Non-pharmaceutical Interventions seeking to improve the outcome and quality of life of our target diabetic patients.

### **3. Type of outcome assessment**

Reported outcomes of included studies were decided to the following extent:

1. Improvements in objective clinical measures,
2. Improved healthy behaviours,
3. Overall improved QOL.

## VII. **Search strategies: study identification and description**

This section reports the procedure employed for screening and searching through databases for the identification of pertinent research articles. Procedures pertaining to data extraction, quality assessment, and narrative synthesis of included studies are also detailed in this section.

With the help of Mrs. K Fournier in September 2016 (the specialist librarian already mentioned), a systematic and comprehensive literature search was done through five databases such as those in Ovid (Medline, Embase, PsychInfo, Cochrane), and Cinahl, using a combination of Mesh (medical subheadings) and keywords. These were:

“diabetes type II”, OR “diabetes mellitus”

AND

“Canada”

AND

“therapy”, OR “education”, OR prevention”, OR treatment, OR “education”, OR “intervention” (see appendix for complete list)

Search filters were used to identify diabetes intervention studies that were published between the years 2005 and 2016, of actuality, for more recent research on diabetes and this subgroup. Even though our target of inclusion was from 2010 to 2016, we ran our search from 2005 to 2016 to ensure we did not exclude important works. The search was done to find pertinent articles that respond to the review question

effectively. Zotero, a power research tool, was used to store, organize and analyze all retrieved articles.

### **1. Data collection and study selection**

Removal of all duplicate files was done in Zotero. We then proceeded to eliminate articles published before 2010. For the remaining articles, we thoroughly reviewed all titles and abstracts against our inclusion and exclusion criteria. All articles that fully met our inclusion criteria were retained. Any article that met some criteria was also retained for full article review. The selection process (Figure 4) is fully mapped using the PRISMA model.

### **2. Strategy for data extraction and organization**

The systematic extraction of data from all included research studies was organized using a data extraction table with the following categories:

1. Study (Main author's last name of author and year of publication)
2. Study Design
3. Intervention
4. Sample and Setting
5. Duration of study
6. Culturally adapted/ Intervention
7. Outcome measures
8. Main findings

## **VIII. Quality assessment**

The assessment for quality was done using a quality assessment tool, adapted from Boland et al. (2014). The tool was employed to assess the quality of the methods of research used and to detect bias within all included studies. The quality assessment tool was effectively employed to assess randomized controlled trials and quasi experimental studies based on twelve questions designed to detect bias (Table 2). All included studies were given a point of 1 for every check mark. Studies were then categorized as “high”, “medium”, or “low” based on the quality of their rating.

Studies received a high rate based on the following criteria:

- 1) Target population were represented in the sample
- 2) Employed intervention designed to measure improvements at follow-up
- 3) Blinded all participants to the research question
- 4) Controlled confounders
- 5) Employed reliable and valid outcome assessment measures
- 6) Clearly reported a dropout rate (< 25%)

## **IX. Analysis**

A Narrative synthesis has been employed to synthesize our findings. A narrative synthesis is simply defined as “any presentation of results using words only (with reference to the data in tables)” (Boland et al., 2014). The important caveat is to remember that this exercise is not simply a repetition of data from the tables into the text. This important step allows for an investigation of what made the intervention

effective. The tables describe the data while the text reports the overall finding (Boland et al., 2014). The employment of a Narrative synthesis is commonplace as seen in diverse systematic reviews (Arai et al., 2007; Russell et al., 2010).

In the process of the narrative synthesis, a summary of descriptive data for all included studies is presented in a series of tables (Boland et al, 2014). The descriptive data have been divided over two separate tables, namely: a study characteristics table and participant characteristics (adapted from Boland et al., 2014, p.93-94). Tables have been examined to emphasize significant differences and similarities in reported descriptive and analytical values. This is essential, because of the current gap in culturally sensitive interventions and the necessity to assess the available evidence systematically. Since there is clear heterogeneity across the main findings, a Narrative synthesis gives a succinct approach to this review. Researchers agree that Narrative methods are appropriate where meta-analysis and other synthesis techniques are not practical (Boland et al., 2014; Cochrane Collaboration, 2008; Popay et al., 2006).

Differences in interventions, study design, participants and outcome measures, in this review, satisfied the employment of a Narrative synthesis instead of a meta-analysis. A systematic review does not always warrant a meta-analysis, especially when data are not suitable for combination in a meta-analysis (Boland et al., 2014).

The generic framework developed to characterize narrative synthesis, and laid out by (Rodgers et al. 2009) includes:

- developing a theory of how the intervention works, why and for whom;
- developing a preliminary synthesis;

- exploring relationships within and between studies;
- and assessing the robustness of the synthesis product.

Even though each of these elements is necessary to the narrative synthesis, they do not necessarily happen in sequential or independent form (Rodgers et al., 2009). Multiple tools and techniques, within this framework, can be employed. Researchers agree that the use of any tool depends on data being synthesized (Rodgers et al., 2009). The framework provides a succinct way for structuring a narrative synthesis while rendering the process more transparent and rigorous (Rodgers et al., 2009).

This synthesis sought to assess whether interventions are culturally sensitive to the group in question. Some of the elements in “exploring the relationships within and between studies” and “assessing the robustness of the synthesis product” will suffice in rendering an effective narrative synthesis.

Table 2 (adapted from Rodgers et al. 2009), describes some elements of each tools or techniques evaluated for their appropriateness and relevancy in this synthesis.

**Table 2. Tools and techniques that may be used in developing a preliminary synthesis**

<b>Name of tool/technique</b>	<b>Comments in relation to current synthesis</b>	<b>Should this tool/ technique be applied here?</b>
<b>Tabulating (DPS)</b>	Description of study characteristics and results.	Yes
<b>Textual descriptions (DPS)</b>	No need to determine which aspects of each Study will be drawn from the report at this stage. Findings from the data extraction table will be given here.	Yes, but at a later stage
<b>Groupings and clusters (DPS)</b>	Despite only 3 studies, they will be organized by intervention type	Yes
<b>Vote counting as a DT (DPS)</b>	Cannot convert data to odds/ratio/relative risk/mean differences. Data not provided in all studies.	No
<b>Transforming data as a CR (DPS)</b>	Different outcomes cannot be standardized	No
<b>Translating data (DPS)</b>	Data mostly quantitative cannot be translated	No
<b>Qualitative case reports/textual descriptions (ER)</b>	Done as textual descriptions of each study	Yes
<b>Best evidence synthesis (ARS)</b>	selection of studies (Inclusion/Exclusion criteria)	Yes
<b>Examination of moderator (ER) variables and subgroup analyses</b>	Variables that might moderate the main effects: Population and intervention	No*
<b>Critical reflection of synthesis (ARS)</b>	Pointing the limitation of the review	Yes

Abbreviation: DT, descriptive tool; CR, common rubric/ ER: exploring relationships/ ARS: assessing the robustness/ DPS: developing a preliminary synthesis/ \*goal of the review is to assess whether interventions are culturally sensitive.

## **X. Description of each element of the generic framework developed to characterize narrative synthesis (adapted from Rodgers et al. 2009)**

### **1. Developing a theory**

All studies described interventions which sought to improve the outcome for T2DM participants. They detailed how the intervention worked for T2DM patients. Chapter 1 presented a description of our theory. Its aim was to help establish decisions on the type of studies to include in relation to the systematic review question.

### **2. Developing a preliminary synthesis**

The guidelines suggested by Popay et al. (2006) entail that “how a reviewer approaches the preliminary synthesis . . . will depend in part on whether the evidence to be synthesised is quantitative, qualitative or both” (Popay et al., 2006). In terms of diabetes interventions, as expected data were mostly quantitative ranging from experimental (RCTs) and quasi-experimental designs. As such, only three of the tools and techniques were employed to guide our preliminary synthesis.

### **3. Tabulating the data**

Data were extracted in tabular form from primary studies as suggested by Popay et al. (2006). Data were extracted based on Study, study design, intervention, sample and setting, duration of study, culturally adapted/ intervention, outcome measures, and main findings (see Table 2). It was evident, from the table that all studies aimed to improve the outcome and potentially DQOL of participants.

#### **4. Textual descriptions**

Textual descriptions are an essential exercise in describing the interventions in more details than the actual tables. This increases familiarity with each study helping with the contrasting and comparison found across all included studies. Experts suggest that this may be an unnecessary duplication of work and might be better left for a later stage of the synthesis process (Exploring Relationships) (Rodgers et al., 2009).

#### **5. Groupings and clusters**

As examined in the data extraction table, grouping is an essential way to determine a “dominant group or clusters of characteristics” (Rodgers et al., 2009). The apparent differences in this review guided clustering into: the intervention and study design.

#### **6. Exploring relationships within and between studies;**

At this phase of the synthesis, the reviewer moves beyond identifying, listing, tabulating and/or counting results so as to explore relationships within and across the included studies (Rodgers et al., 2009). Additional thorough examination was imposed on the outcomes that came out of the preliminary synthesis. This was undertaken to establish factors that may describe the differences within and between the included studies and assess the effect of each interventions on T2DM. This is the technique mostly used in this synthesis to draw comparisons within and between studies and to assess whether each included study’s intervention is culturally sensitive to African and Caribbean patients living with T2DM in Canada.

Characteristics employed to analyze the differences within and between studies were done using: Qualitative case reports/textual descriptions (as adapted from Rodgers et al. 2009).

## **7. Qualitative case reports/textual descriptions**

Writing a short summary of each article, at this stage, allows the reviewer to extract more information that may have seemed irrelevant early in the synthesis, but may have become relevant in later stages of the synthesis. These summaries were structured to provide details pertaining to the setting, participants, intervention, comparison and outcomes, besides any other factors of interest (Rodgers et al., 2009).

Exploring differences and similarities within and between studies is essential for putting together a robust assessment of the quality of the accessible evidence that leads to a synthesis in this narrative synthesis (Popay et al., 2006). This was enough to help us assess our findings to see whether the interventions were culturally sensitive to African and Caribbean patients living with T2DM in Canada.

## **XI. Assessing the robustness of the synthesis**

Conclusions were drawn from the examination of relationships within and between studies. Such analysis assists with the production of a careful evaluation of the strength of the available evidence (Popay et al, 2006; Rodgers et al., 2009). For the purpose of this review, a critical reflection of the synthesis and methodology sufficed in concluding this narrative approach.

## **1. Critical reflection of synthesis and methodology**

Popay et al. (2006), suggest that an executive summary of the synthesis is an effective way to review the methodology of the synthesis and its limitations, while identifying domains where future research may be beneficial (Popay et al., 2006). Researchers agree that implications for future research can be more extensive when derived from the narrative synthesis vis-à-vis a meta-analysis (Rodgers et al, 2009).

## **XII. Conclusions of the Narrative approach and postcolonial discourse**

As already noted in our first chapter, the issue of research and interventions can be clearly understood in terms of power relationships between whites and minority populations across many academic disciplines. This becomes important considering the lack of culturally sensitive interventions for T2DM when it comes to African and Caribbean patients living in Canada. The analysis of our findings was followed by a critical examination of each article through postcolonial discourse, in combination with the detailed narrative approach. Figure 3 lays out the framework that guided the analysis of cultural sensitivity, in our findings, in light of postcolonial discourse.

There is a reciprocal relationship between colonialism and research. African and Caribbean peoples' perceptions are still largely affected by the legacy of colonialism. Cultural preservation through beliefs, language, and food preferences affect behaviour (Cooper Brathwaite et al., 2016). In terms of research and interventions, African and Caribbean people living in Canada are not only part of a societal visible minority, they also are a part of a visible minority as far as research and interventions. Success in

integrating this group into full participation in research and interventions is through a cultural sensitive approach.

Figure 1. Power relationships, postcolonial discourse and cultural sensitivity

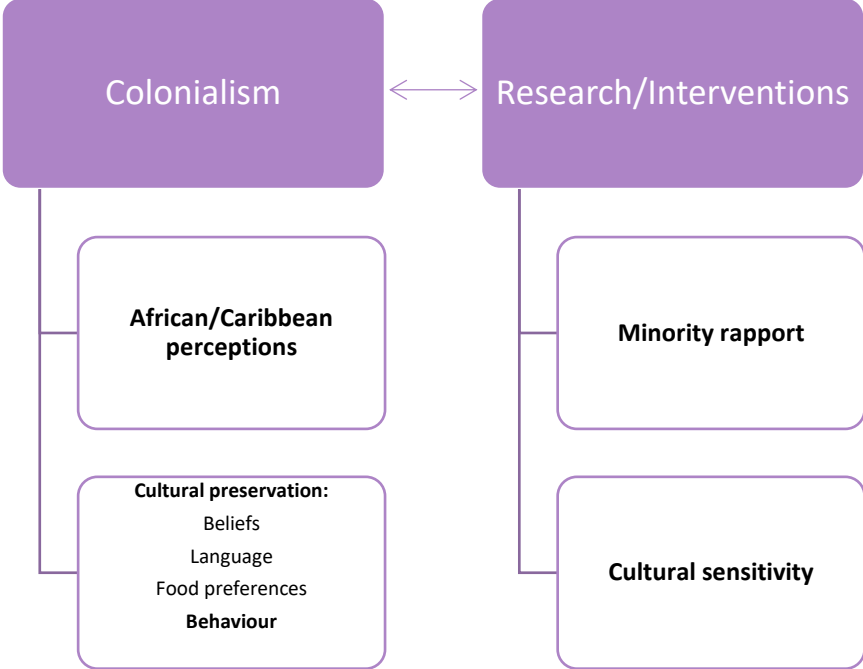


Figure 3 shows a link between colonialism and perceptions held by African and Caribbean peoples. When a member of this population immigrates to the Western world, he or she tries to preserve culture through beliefs, language, food preferences and behaviour. Researchers hold a power platform that ultimately affects policy. As research and interventions takes all this into consideration, greater cultural sensitivity can be incorporated in interventions where visible minorities are targeted.

## Chapter 3: Results

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### I. Search results

A thorough, comprehensive and sensitive search was fully achieved on December 12, 2016. Through a combination of Mesh and keywords, a list of 2117 articles were produced. From each database, the number of retrieved articles was as follows:

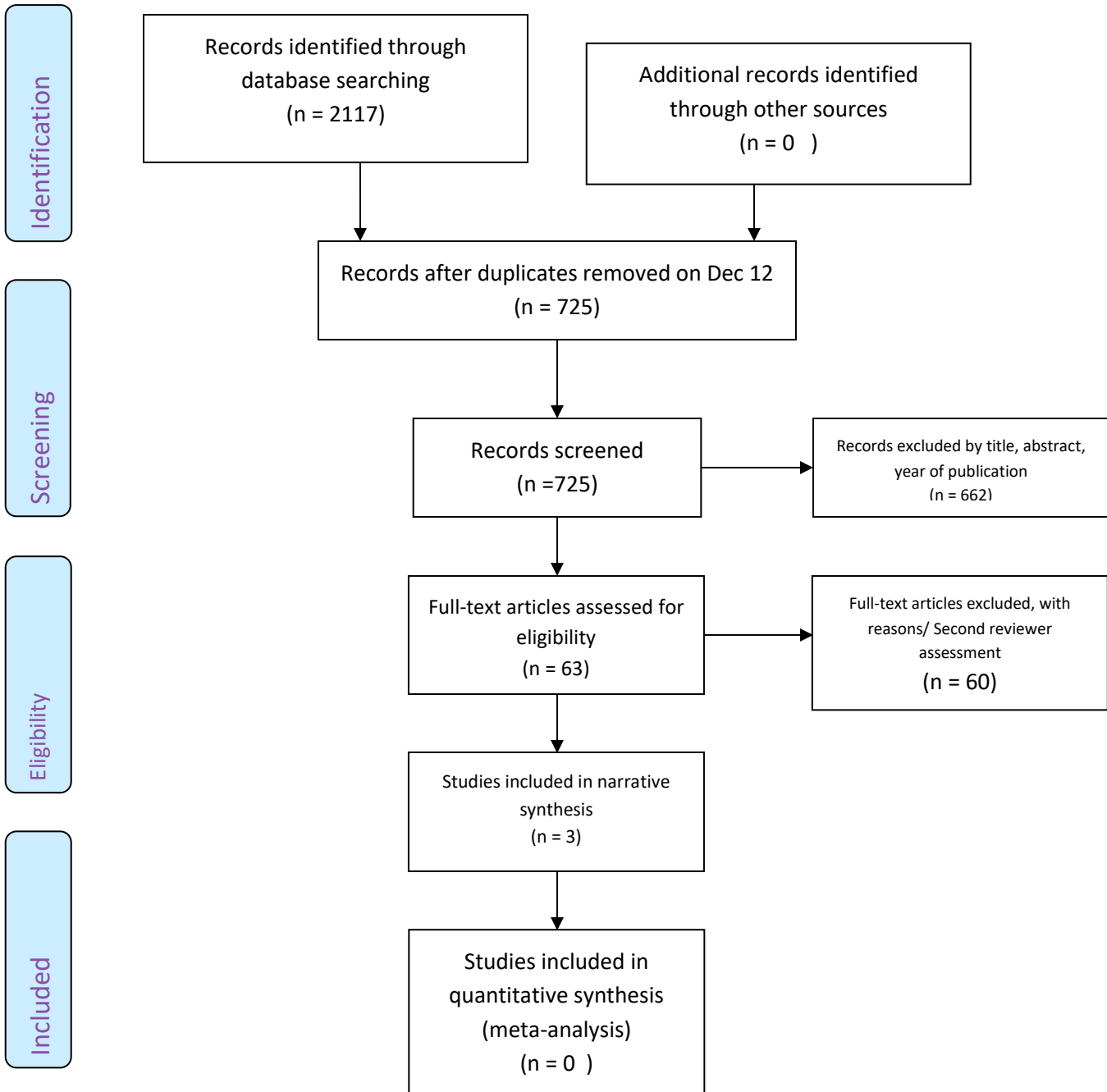
- 392 from CINAHL
- 563 from Medline
- 825 from Embase
- 52 from PsychInfo
- 285 from Cochrane

Further search in PubMed and Google scholar yielded no new articles. Even though we were looking at the research from 2010-2016, we expanded our search from 2005-2016 to ensure that we did not miss any relevant article that may for some reason appear before 2010. The removal of duplicates left a total of 725 articles. 662 records were removed after titles and abstracts were reviewed for relevancy against the inclusion/exclusion criteria and for being outside the 2010-2016 range. 63 records were then reviewed fully and 3 articles were selected to be included in the review since no other articles, from the reference list of included studies, were relevant. A detailed flow diagram for the selection process is shown in Figure 4.

## **II. Included studies**

Three studies were included based on meeting the inclusion criteria. Two are experimental studies, more specifically randomized controlled trials (Jenkins et al., 2014; Wayne et al., 2015) and one was a single- group pretest and posttest quasi-experimental studies (Fan et al., 2014). These studies were included because they met our inclusion criteria. There exists a fourth article, but its full text was inaccessible. The authors at McGill University were contacted and confirmed that article is not yet published.

**Figure 2: PRISMA Flow Diagram**



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097. Employed the Moher & al. 2009 template.

### **III. Data extraction**

The extracted characteristics from each published research article included the name of the authors, year of publication, sample size, setting and province, duration of the study, intervention description, outcome measures, and main findings. The said features of all three included studies on T2DM interventions are presented in table 3.

**Table 3. Characteristics of included studies (*Quasi-experimental study*):**

Study	Study design	Intervention Sample and Setting	Duration of study	Culturally adapted/ Intervention	Outcome measures	Main findings
Fan et al, 2014	<b>Pilot study</b> <b>Single-group pretest and posttest quasi-experimental design</b>	70 participants (56 completed the study)  4 Caribbean- from Jamaica/Guyana* <i>*Guyana considered as part of Caribbean population due to strong similarity in culture/ 2 Africans</i>  Mean age 55.6 y.  Family health Centre in Ontario	3 weeks of intervention/ follow-up at 3 months	Diabetes Foot Ulcer Education program included 2 sessions consisting of a 1- hour lecture presentation, 1- hour foot self-care hands-on practice training for a total of 7 topics (within the first week). Telephone booster sessions offered once a week for 2 weeks to reinforced material learned and discusses health concerns  <i>No cultural sensitivity specified.</i>	Diabetes foot self-care knowledge, self-efficacy, and behaviour	The group showed significant improvement, (at 3-months follow up than at pretest), in diabetes foot self-care knowledge (p < .01), self-efficacy (p = .000), foot self-care behaviour (p < .01)

**Table 3. Continued... (Experimental trials):**

Study	Study Design	Intervention Sample and Setting	Duration of study	Culturally adapted/ Intervention	Outcome measures	Main findings
Jenkins et al. [2014] RCT	<b>Randomized controlled trial design</b>	141 participants (2 Africans in control, 4 Africans in test group) with type II diabetes (mean age 59.10 y)  Canadian academic centre in Ontario	1.5 years	Nutrition intervention (test diet), dietary advice, and follow-up smartphone app connection with health coach (3 months). Test group: Daily supplemental low-GL diet with canola oil-enriched bread. Control group: Daily supplemental high-fiber diet (whole wheat) foods.  No cultural sensitivity specified.	A1c, height and weight, blood pressure, glycemic control	After 3 months, HbA1c (p=0.002) improved for test more the control. Control saw improvement in systolic blood pressure (p<0.001) GC improved in test more than control. More weight loss in test than control (p=0.010), though loss in both groups.  Improvement in vascular reactivity observed in control group.
Wayne et al. [2015]	<b>Randomized controlled trial design</b>	131 adults participating adults (including: 5 black Africans, 39 black Caribbean, 6 West Indians) participants  Mean age of sample: 53.2 y  Health Care Centre in Ontario	6 months	Health coaching (in person / 38 minutes/week) advice with additional access to coach via smart phone app for test group.  Health coaching for control (in-person 39 min/week) without access to smart phone app. Provided coach's contact phone contact.  No cultural sensitivity specified.	A1c, diabetes knowledge, nutrition, PA, glucose, satisfaction, mood.	After 3 months of enrollment, mean HbA1c was significantly controlled for test group from baseline (p=0.03). But it was not statistically different at 6 months because control groups mean HbA1c significantly improved between 3 and 6 months while test group remained stable. Improved satisfaction with life in both IG and CG (p=0.001; p=0.003) respectively. Improved dietary choices in IG vs CG.

Abbreviations: IG, intervention group; CG, control group; PA, physical activity; GC, glycemic control

#### **IV. Quality score assessment**

The quality scores for each included study are detailed in Table 4. The quality assessment shows ratings of one high (Wayne et al., 2015), and two medium studies (Fan et al., 2014; Jenkins et al., 2014). Treatment allocation concealments of participants were either unclear or non-existent in all three interventions despite reporting results by intention to treat. The lack of treatment concealment, participants and outcome assessor blinding were cause for the medium rating for Jenkins et al. (2014), in addition to that is the lack of detailed recruiting methods for Fan et al. (2014). All three studies detailed Withdrawal and dropout rates were clearly reported. All three studies were conducted in Canada in the province of Ontario.

Table 4. Quality assessment table for randomized controlled trials and quasi experimental studies of all included studies (adapted from the model employed by Zeh et al, 2012 and adapted from Moher et al., 2010)

Quality assessment													
Interventions	1	2	3	4	5	6	7	8	9	10	11	12	Total
Fan et al. (2014)	✘	✘	✘	✘	✓	✓	✓	✓	✓	✓	✓	✓✘	7/12 (58%)
Jenkins et al. (2014)	✓	✘	✘	✓✘	✓	✓	✓	✓	✓	✓	✓	✓	9/12 (79%)
Wayne et al. (2015)	✓	✓✘	✓	✘	✓	✓	✓	✓	✓	✓	✓	✓	10/12 (83%)
The questions below pertain to standard of quality for assessing all included studies (adapted from Boland et al. 2014; Zeh et al, 2012):													
1. Was randomization explicit and adequate? 2. Was there concealment of treatment allocation?													
3. Were participants appropriately blinded? 4. Was the outcome assessor clearly blinded?													
5. Are primary and secondary outcomes clearly defined? 6. Was the drop-out rate clearly described?													
7. Did ≥ 80% of the number randomized provide data at follow-up? 8. Are primary and secondary outcomes clearly described?													
9. Were all participants' characteristics compared across all treatments at baseline (confounders)? 10. Is an explicit intention-to-treat analysis described?													
11. Are results for all outcomes clearly detailed even if unfavourable to desired outcome? 12. Are recruitment methods appropriately described?													
Yes ✓ (item adequately assessed); No ✘ (item not adequately assessed); Partially ✓✘ (item partially assessed); NS not stated; NA not applicable. A score of 1 point is given for each of the 12 answers with ✓.													
Scoring are classified as follows:													
<ul style="list-style-type: none"> <li>• ≥ 80% is considered high quality</li> <li>• 50-79% is considered medium</li> <li>• &lt; 50% is considered low quality</li> </ul>													

## V. Data Analysis

### 1. Relevant characteristics of studies

The overall characteristics of the 3 included studies are shown in Table 4. Important differences were observed for all features.

**Table 5. Characteristics of studies**

Characteristics of the 4 included Studies	Description	Result summary
Study design	RCT	2
	Non-RCT design	1
Country	Canada	3
Location in Canada	Ontario	3
Sample size	>50	3
Year of publication	2010-2016	3
Length of intervention	> 6 months	3
Quality appraisal	High	1
	Medium	2

Abbreviation: RCT, randomized controlled trial.

The three studies were conducted between 2010 and 2016. All trials were carried out in Canada. Two RCTs design were identified (Jenkins et al., 2014; Wayne et al., 2015). Jenkins et al. (2014) studied the effect of nutrition and health coaching on measured clinical outcomes such as HbA1c, blood pressure, glycemic control, and weight loss (Jenkins et al., 2014). Wayne et al. (2015) applied health coaching via the use of technology to measure HbA1c, diabetes

knowledge, nutrition, PA, glucose and overall satisfaction at follow-up (Wayne et al., 2015). The single quasi-experimental study focused on diabetes education intervention. Fan et al. (2014) applied a diabetes education program over three weeks and followed up 3 months later to observe whether there was an improvement in diabetes foot care knowledge, self-efficacy, and behaviour. The study was limited by a lack of randomization and control group (Fan et al., 2014).

Fan et al. (2014) conducted a pilot study with adults patients at risk for a DFU (n=56) in Ontario. Three interventions meetings suggested that educational-based sessions are effective at improving health behavior with T2DM patients at risk of developing FU. Sessions were spread over a period of three weeks focusing on knowledge-based information and teaching on proper foot care, foot and leg massage and exercise. From baseline to 3-month follow-up, the intervention resulted in increases in self-efficacy for all foot self-care behaviours, and exercise (Fan et al., 2014).

A parallel RCT design, conducted in Ontario with T2DM, included a 3-month dietary advice and treatment of a low-GL diet given as canola oiled-enriched bread supplement and a whole-grain diet as whole wheat bread supplement for the control. Differences were noted between the control and the treatment groups. Jenkins and others found an improvement in glycemic control for the treatment group and improved vascular reactivity for the control group (Jenkins et al., 2014).

Similarly, in Ontario, Wayne and others assessed the effectiveness of health coaching with T2DM patients using mobile phone monitoring support over a 6-month period. Control

group were only given in-person coaching with no mobile phone follow-up option while the treatment group received regular phone monitoring support in addition to the face-to-face intervention. The researchers found a significant difference at the 3-month follow-up ( $P=.03$ ) in HbA1c with treatment group but not at 6 months. Both groups noted improvements in HbA1c levels at 6 months while treatment group saw significant improvements in anthropomorphic measures such as body weight and waist circumference (Wayne et al., 2015).

Table 6. Patient characteristics of included studies

Study	Intervention	Treatment duration (months/ days)	Follow-up (days)	Number of patients randomized	Estimate age (years)	Numbers of African/Caribbean patients	Number of Males	Number of Females
Fan et al. [2014]	Diabetes Foot self-care Education program	3 months	90 days	56 non randomized	56	6	26	30
Jenkins et al. [2014]	Dietary advice/Intervention	18 months	Every 90 days	141	59	6	77	64
Wayne et al. [2015]	Health coaching	3 months	60/90 days	138	53.2 years	60	27	70

## VI. Analyzing the similarities between studies

Exploring the relationships within and across studies can be pursued by looking at the relationships between individual study characteristics and those between the findings of other studies (Rodgers et al., 2009). The single tool employed for this purpose is qualitative case reports/textual descriptions (Rodgers et al., 2009). Table 6 shows the many characteristics for which there are some similarities between each study.

### 1. Qualitative case reports/textual descriptions

#### **Pilot study: Single-group pretest and posttest quasi-experimental design**

##### **Fan et al, (2014)**

##### *Study's objectives*

The objective is to assess the effectiveness of an educational intervention on patients' self-care knowledge and behaviour in a 3-week single group, non-randomized, and quasi-experimental study.

##### *Study participants*

Adult patients diagnosed with T2DM, at low risk of developing DFU, aged between 40-70 years who underwent risk assessment for DFU at pretest. Risk for foot ulceration was assessed anatomically and physiologically. Feet were objectively assessed by examination of the DPA and PTAP.

##### *Intervention*

Participants were assigned to a foot self-care intervention about risk factors and proper foot care. The intervention consisted of seven topics associated with awareness of risk factors and proper self-care including: the importance of comprehensive annual examination of feet by a

health care professional, daily self-care and self-monitoring of foot. The researcher delivered the intervention in two one-on-one, face-to-face interactive teaching sessions within the first week. These were followed by two telephone contact booster sessions of 10 to 15 min duration each, offered once a week over 2 weeks.

### *Results and comparison*

Twenty-six men and thirty women participated in the study. Of that number, 5.4% were from Guyana, 1.7% from Jamaica, and 3.6% from Africa (mean age 56 years). The study showed positive results of the educational intervention sustained at 3 months follow up.

### *Limitations*

The researchers emphasized the lack of control group that could have mediated the other apparent limitation related to possible testing effects that usually occur with repeated administration of measure, and social desirability.

## **RCT: Intervention**

### **Jenkins et al, (2014)**

#### *Study's objectives*

The objective is to assess the combined effects of  $\alpha$ -linolenic acid (ALA), monounsaturated fatty acid (MUFA), and low-glycemic-load (GL) on glycemic control and cardiovascular (CVD) risk factors in T2DM patients in a 12-week parallel randomized controlled trial study.

#### *Study participants*

Adult patients aged between 49-69 years with at least a 6-month history of T2DM and taking a stable dose of oral antihyperglycemic agents for at least 2 months before randomization. Patients had HbA1c values between 6.5% (48 mmol/mol) and 8.5% (69 mmol/mol) at the initial screening and subsequently at one week prior to randomization.

### *Intervention*

141 participants were randomized into a treatment and a control group. 70 participants, of whom 3 were of African descent, received Canola-Low GL dietary advice in the treatment group while 71, including 4 Africans, received High Wheat Fiber dietary advice in control group over a period of 12 weeks.

### *Results and comparison*

The relative glycemic index (GI) and glycemic load (GL) were statistically significant in reductions for the treatment diet in comparison with the control diet were -19 GI units (95% CI -20 to -17,  $P < 0.0001$ ) and -52 GL units (95% CI -59 to -45,  $P < 0.0001$ ), respectively. There was significant decrease in HbA1c ( $p=0.002$ ) and CVD in treatment compared with control while control showed improved vascular reactivity.

### *Limitations*

Researchers highlighted the relatively small effect size of the primary outcome (HbA1c), of 0.5% (5.1 mmol/mol) in comparison with the larger than previously observed reduction for the control diet of 0.3% (3.4 mmol/mol).

## **RCT: Intervention**

**Wayne et al, (2015)**

### *Study's objectives*

The objective is to evaluate the effectiveness of a health coach intervention with and without the use of mobile phones on health behavior in patients with T2DM.

### *Study participants*

Adult multi-ethnic T2DM patients from lower-socioeconomic status community aged between 41 and 65 years.

### *Intervention*

138 participants were initially randomized. Data was only available for 97 participants (of whom 60 were either from Africa or the Caribbean). Participants were randomized into two groups of n=48 and n=49 for the intervention and control groups respectively.

### *Results and comparison*

Significant improvement in HbA1c at 3 months ( $p=.03$ ) for treatment group. No significant difference at 6 months between both groups as control group improved outcome. Treatment group saw significant improvement in anthropometric measures such as weight and waist circumference ( $p=.006$ ,  $p=.01$  respectively). Both groups improved in overall QDOL.

### *Limitations*

The authors noted motivation to participate as potential for bias and limitation in generalizability, since those who met the inclusion criteria but declined to participate constitute an unstudied population. High attrition rate because of control condition was also noted.

## VII. Cultural sensitivity snippet

While all studies, in table 6, present similar patient characteristics, they all fail to consider adapting the intervention to the culture of participants. All three studies reported no culturally sensitive adaptation to their interventions. The systematic review started with a total of 63 articles included for full review. Sixty articles were excluded because they did not fit the criteria of explicitly defining the target population and mentioning cultural sensitivity. In the small sample of 3 articles, cultural sensitivity is still not addressed. These results justified that there is indeed a significant gap in Canadian literature. The small sample size shows the absence of studies that are culturally sensitive to our target population when it comes to intervention and research. The fact that participants in all studies varied in terms of ethnicities, clearly shows the extent of Canada's growing multicultural fabric. Nevertheless, outcomes were independent of cultural consideration in all studies making it unnecessary to employ any cultural competent assessment tool of any kind. A succinct analysis of the lack of cultural sensitivity will be undertaken in the next section in comparison to studies where such adaptations yielded significant results for ethnic T2DM patients in other industrialized nations.

### I. Assertion of systematic review's findings

This review resulted with a small number of included articles. All three papers, of heterogeneous designs, report more than two positive outcomes with the interventions. These articles, met with a quality assessment scale, scored either at high or medium in terms of their particular study design characteristics. All three interventions, in Canada, contained a sample of African and/or Caribbean patients within a larger multi-ethnic group of participants. There were notable improvements in self-care knowledge and behavior (Fan et al., 2014). Positive progression was shown in CVD, GI, and GL (Jenkins et al., 2014). One study showed positive results in improving the HbA1c marker and anthropomorphic measures such as weight and waist circumference. To better treat its multiethnic participants, the trial was conducted with the help of a health coach, who is credited as a behavior-change counselling specialist with expertise in chronic disease management and ethno cultural backgrounds, yet the intervention was not cultural sensitive (Wayne et al., 2015). We could not systematically find a single cultural sensitive T2DM intervention with only this population in Canada. The mixture of ethnic participation beyond our study population, in all three studies, attenuates the generalizability of such interventions to Africans and Caribbean patients only in Canada.

### II. Findings in context with other studies and power relationships

There is a gap in diabetes research of cultural sensitivity, when it comes to African and Caribbean patients in Canada. Nevertheless, effective cultural sensitive research is increasingly surfacing in many industrialized countries focusing on T2DM interventions with ethnic

minorities. The body of literature on cultural sensitive interventions to African and Caribbean patients is not yet very substantive in Canada.

Fan and others studied the effectiveness of a diabetes educational intervention on 56 patients' self-care knowledge and behaviour in a 3-week single group, non-randomized, and quasi-experimental study in Ontario, Canada. Participants were assigned to an educational foot self-care intervention about risk factors and proper foot care with follow-up booster telephone calls. The intervention consisted of seven topics on risk factors and proper self-care including: the importance of comprehensive annual examination of feet by a health care professional, daily self-care and self-monitoring of foot. Twenty-six men and thirty women participated in the study. Of that number, 5.4% were from Guyana, 1.7% from Jamaica, and 3.6% from Africa. At three months Follow-up, the results of study were positive (Fan et al., 2014).

### **Power relationships**

The initial number of participants stood at n=70. We are not told whether our study population is part of the 14 dropouts. Participants were of a diverse ethnic background including: Asia, the Caribbean, Europe, North America, South America, and Africa. Despite the short-term success of this study, it remains that culture is not easy altered over a short period of time. Most African and Caribbean patients are first generation immigrants. The hegemony of eurocentrism, in research, suggest that even with multi-ethnic samples, culture may not necessarily emerge as an important factor in health care research, hence suggesting this is one of the reason why treatment is not often patient-centered and culturally adapted for immigrants.

In another study, Jenkins and others evaluated the combined effects of  $\alpha$ -linolenic acid (ALA), monounsaturated fatty acid (MUFA), and low GL on glycemic control and CVD risk factors in 141 T2DM patients aged between 49-69 years, in a 12-week parallel randomized controlled trial study in Ontario, Canada. The trial was conducted with the help of a health coach. 70 participants, of whom 3 were of African descent, received Canola-Low GL dietary advice in the treatment group while 71, including 4 Africans, received High Wheat Fiber dietary advice in control group over a period of 12 weeks. Patients in the intervention group significantly improved in terms of their relative GI and GL. Researchers also report that there was significant decrease in HbA1c and CVD in treatment compared with control while control showed improved vascular reactivity (Jenkins et al., 2014).

### **Power relationships**

For such a large cohort, the number of Africans or Caribbean participants is very minimal at best. Recruiting is always difficult especially when it comes to African and Caribbean patients. More research is needed to know more about the perceptions held by this population vis-à-vis disease. Effective recruiting tools are possible when you meet patients where they are at. It was already mentioned in our introduction that disease perception for this population is still shaped by the effects of colonialism. Immigrants often preserve their cultures through food preferences. They try as best as they can to continue to eat culturally. An opportunity can arise when adapting high fiber and healthy food choices to the cultural food preference of minorities.

Wayne and others tested of a health coach intervention with and without the use of mobile phones to improve health behavior in patients with T2DM. 138 participants were initially randomized into two groups, of whom 60 were either from Africa or the Caribbean. The

intervention which consisted of weekly face-to-face health coaching and telephone message follow-up, extended for 6 months for treatment group while control received no phone follow up. This RCT found significant improvement in HbA1c at 3 months for treatment group. No significant difference was found at 6 months between both groups as control group improved outcome. The treatment group saw a significant improvement in weight and waist circumference while both groups improved in overall QDOL (Wayne et al., 2015).

### **Power relationships**

The study targeted adult multi-ethnic T2DM patients from lower-socioeconomic status community aged between 41 and 65 years; hence the larger African and Caribbean participation. Coaching alone may have been insufficient to fully address the health issue. The study presupposes that participants are from a lower-economic status community without giving recommendation on how to sustain positive results and empower this group towards a better economic future. In order for the results to be generalizable to Africans and Caribbean patients in Canada, researchers ought to conduct a longer assessment over a longer period of time. Culture is once again not taken into consideration despite a sizeable number of African and Caribbean patients. With limited resources, it may be difficult to sustain the benefits of such interventions long-term.

### **1. Other studies**

Interventions that aim to improve outcomes for ethnic minority diabetic patients have gained momentum in many industrialized nations. Other studies clearly show the benefits and

effectiveness of intervention strategies that integrated cultural sensitive approaches to their methods in other industrialized nations.

A systematic review by Zeh and others show that culturally competent diabetes care interventions are beneficial in improving diabetes-related outcomes in ethnic minority groups (Zeh et al., 2012). Eleven studies, on any type of diabetes, were analyzed based on primary research data on the impact of culturally competent interventions on any outcome measures to any ethnic minority population living within a majority population globally. The geographic location of studies included: the UK, the USA, Denmark, and Austria. Of all included studies, five were RCTs; two were qualitative action studies, two retrospective cohort studies, one quasi-experimental study, and one qualitative study engaging focus groups and interviews. Zeh and others report that ten of the 11 included studies showed, at minimum, two positive impacts on patients' diabetes outcomes. Structured interventions that added culturally adapted teaching and learning methods showed more positive results.

Hawthorne and others sought to systematically determine the effectiveness of culturally appropriate health education for T2DM patients from ethnic minority groups living in high- and upper-middle-income countries including the USA, the UK, and the Netherlands. Only 11 RCTs were included in the analysis. Overall, the research showed that culturally adapted health education had more effect than habitual health education in improving HbA1c and knowledge in the short to medium term (Hawthorne et al., 2010).

Culturally sensitive interventions adapted to specific ethnic minorities showed positive results in a systematic review by Joo (2014). The researcher evaluated the effectiveness of

culturally tailored community-based T2DM interventions to Asian immigrant cultures in the United States of America. Nine studies, of which four were RCTs and five quasi-experimental, were included in the review. It was found that tailoring diabetes interventions to Asian immigrant populations' cultures is very effective at improving outcomes based on clinical measures, psychobehavioral outcomes and satisfaction with the program.

A culturally sensitive approach meets minority patients where they are at. It shifts research from a number's perspective into a patient-centered focus while maintaining the integrity of scientific rigour.

**Bakombo, S; Laperrière, H**

**Article d'opinion et commentaire**

**Privège, apathie et intégration culturelle dans la recherche médicale : le cas des interventions de promotion de la santé avec le diabète type II**

La prévalence des maladies chroniques ne cesse de poser un défi au système de santé Canadien. Le diabète n'en fait pas exception car il est à la base des augmentations notoires d'incapacités physiques, et d'une croissance d'absentéisme. Or ce problème affecte la productivité et potentiellement l'économie de la nation surtout que l'on estime une croissance vers \$16 milliards du calcul établit de \$11.7 milliards en 2010 (CDA, 2016).

Il s'avère que plusieurs recherches médicales se poursuivent, depuis des décennies, afin d'atténuer les effets néfastes du diabète tout en augmentant l'espérance d'une qualité de vie adéquate pour ces patients affectés (Creatore et al, 2012; Hawthorne et al. 2010; Joshi et al, 2010). Les minorités visibles d'origine d'Afrique et des Caraïbes sont parmi les groupes les plus touchés par cette maladie. Or, ces sous populations subissent une double ou triple minorité aux niveaux raciales, linguistique et scientifique. L'Africain ou le Caribéen est minoritaire par rapport à sa race.

J'ai émigré au Canada (Bakombo), avec ma famille, en 1990 en provenance de la République Démocratique du Congo. J'ai expérimenté certains challenges face à l'intégration, quoique mon expérience fût moindre que celles des immigrants adultes. Mon parcours académique varié inclut l'éthique biologique, la littérature Française (incluant le discours postcoloniale), la religion ainsi que les sciences de la santé à l'Université de Toronto. Je suis persuadé que l'interdisciplinarité de mes poursuites académiques actuelles à l'Université d'Ottawa, ainsi que mes éducations précédentes m'offrent des outils nécessaires pour cette étude interdisciplinaire.

Je suis parfaitement bilingue en Français et Anglais. Ce genre de compétence me permet d'analyser les articles de recherches dans les deux langues. L'université d'Ottawa m'accorde une opportunité unique d'entreprendre des recherches dans les deux langues tout en apportant une contribution considérable par rapport à la santé des immigrants et des Canadiens. Comme je suis membre d'une minorité visible et susceptible à cette maladie, la question du diabète revêt une grande importance et un grand intérêt dans ma recherche d'évidences par rapport à ce qui est fait pour apporter de l'aide à ceux qui ont développé cette maladie.

J'ai eu le privilège de participer à un forum, sur la nutrition pour les diabétiques, au Centre Francophone de Toronto (CFT). J'ai aussi fait du bénévolat au CFT et suis toujours bénévole à l'Hôpital Montfort à Ottawa apportant de l'aide et des visites amicales aux patients des ethnies variées. J'ai fait un sondage pendant 30 heures, auprès des patients au CFT dans l'espace de plusieurs jours. Le sondage visait la qualité des soins ainsi que des axes d'amélioration. J'ai eu le privilège de parler avec plusieurs patients d'origines Afro-Caribéens à propos de leurs attentes et challenges par rapport à la vie au Canada, en tant que minorité visible. Le bénévolat au CFT fut une observation essentielle et un moyen de comprendre les challenges que font face plusieurs patients d'ethnies variées.

J'ai aussi effectué un stage en 2015 au sein du Conférence Board du Canada où j'ai examiné plusieurs articles sur la prévention des troubles métaboliques chez les enfants. Ces articles incluant les revues systématiques, les essais randomisés contrôlés, des analyses méta, insistaient sur l'augmentation de l'activité physique et la réduction des comportements

sédentaires. La synthèse de ces articles a été compilée en réunions d'information et recommandations pour des besoins particuliers de santé au Canada.

Ce papier reflète ma pratique réflexive en tant que futur chercheur dans le domaine. Ces pistes de réflexion se regroupent sous les thématiques « Privilège » « Apathie » et « Intégration culturelle » pour soulever le problème de la recherche biomédicale et des interventions communautaires publiées sur le diabète II au Canada. Elles s'inspirent des questionnements relatifs aux rapports de pouvoir coloniaux (Behrens, 2017; Mudimbe, 1988).

### **Privilège**

Il reste d'actualité que plusieurs minorités n'accèdent pas forcément aux services de santé (Williams, 2001; Creatore, 2012). Ceci est peut-être dû à un manque d'intérêt général quant à comprendre et adapter la culture des minorités aux approches des soins de la santé. Les cadres de recherches scientifiques s'enracinent généralement sur la base de privilèges euro centristes de chercheurs blancs, qui rappellent les structures coloniales. Parce que les milieux scientifiques biomédicaux questionnent peu les dimensions coloniales dans la recherche médicale, comme si la science était neutre, ils maintiennent le statu quo. Toutefois, il appartient désormais à la communauté intellectuelle et scientifique de défier la prédominance du privilège blanc dans ce système médicale euro centriste afin d'intégrer, en plus grand nombre les minorités d'origine d'Afrique et des Caraïbes, non seulement comme participants mais aussi comme acteurs sociaux et comme chercheurs dans la recherche des soins de santé, qui concernent leurs communautés d'origine.

Lors d'une conversation informelle avec une personne haute fonctionnaire d'une firme de recherche ontarienne, je lui fis part d'une étude sur le diabète concernant les immigrants d'origine d'Afrique et des Caraïbes. La personne me dit clairement que ce genre de projet n'intéresserait pas sa firme; personne n'y mettrait de l'argent là-dessus. Les recherches, qui sont aptes à être subventionnées par des fonds privés ou publics, sont celles qui bénéficient une majorité des « Canadiens », laissant peu d'espace pour les minorités. Si peu d'interventions considèrent les dimensions culturelles et coloniales pour le diabète II, peu de chercheurs semblent considérer ces rapports coloniaux dans les pratiques de recherche avec ces populations minoritaires, qui résultent à l'absence de données reconnues pour élaborer des politiques de santé avec une sensibilité culturelle.

Or, le fardeau qu'impose le diabète affecte l'économie du Canada. Les populations africaines et caribéennes s'avèrent celles qui sont les plus affectées; elles devraient être prioritaires pour les recherches et les interventions communautaires de promotion de la santé.

### **Apathie**

Les évidences qualitatives suggèrent que l'Africain ou le Caribéen a une conception de la maladie affectée par sa culture (Cooper Brathwaite, 2016). Il reste possible que le manque d'intégration total de cette population tourne autour de la difficulté quand à rejoindre cette population. Peut-être que l'indifférence que démontre plusieurs membres de ce groupe amplifie ce problème de non-intégration. Cette prétendue indifférence provient peut-être de la peur de vivre à nouveau le traumatisme initial au moment de l'annonce du diagnostic.

Dans le cadre d'une recherche qualitative, j'ai tenté de recruter des participants atteints du diabète du type 2 dans la plus grande ville du Canada. Le Centre francophone de Toronto (CFT) a accepté d'être partenaire de recherche en ce qui concernait ma recherche. Cet organisme est d'une importance fondamentale, offrant des services pluridisciplinaires incluant une clinique médicale, pour les francophones qui vivent à Toronto ou qui y émigrent. Je me suis engagé comme bénévole et eut l'opportunité de travailler à la clinique médicale du CFT auprès des patients menant des sondages dans le but d'améliorer les services des soins de santé. J'ai participé à un groupe de discussion sur la nutrition des patients atteints du diabète de type 2. J'ai eu le privilège de parler à plusieurs patients d'origines Africaines et Caribéens. Malgré ces efforts de proximité directe, le recrutement à la recherche qualitative, même participative, au CFT n'ont pas porté fruit. Pourquoi donc? Voici quelques pistes possibles :

Premièrement, l'expérience de plusieurs furent similaires par rapport à certaines difficultés liées à l'intégration, la langue, l'expérience de la maladie. Plusieurs se sont retrouvés dans une situation difficile à leur arrivée au Canada. Le manque des moyens financiers, le manque d'emploi, et vivre au seuil de la pauvreté tout en encaissant l'aide médiocre du bien-être social ajouta à ce problème. D'autres immigrer avec des compétences académiques et professionnelles. Aussitôt arrivés à Toronto, ils réalisent que leurs compétences professionnelles acquises dans leur pays d'origine ou leurs savoirs traditionnels africains ou caribéens sont inexplorées. Ils réalisent que le rêve canadien n'est qu'une illusion. Le fait qu'ils soient francophones les désavantage, car ils doivent apprendre à parler l'anglais rapidement à des fins d'intégration. Même une fois l'anglais appris, la population majoritaire considère qu'ils ne la parlent pas comme « les Canadiens » et cela nuit à la recherche d'emploi.

La réalité pour plusieurs s'avère qu'avant d'arriver à un niveau adéquat d'une vie prospère au Canada, il leur faudra réaliser des efforts monumentaux. Le simple fait de manger sainement fait partie de cette réalité; elle n'est toujours pas une option viable dans ce cas. On mange pour survivre... et cela avec des efforts monumentaux.

Deuxièmement, contrairement à l'opinion commune, le fait que je sois du même groupe minoritaire que ces patients ne m'avantageait en rien. Je n'ai pu recruter aucune personne. D'abord, la plupart des participants potentiels étaient plus âgés que moi. La maladie est encore taboue pour plusieurs. Aussi, chez plusieurs Africains, le fait de poser des questions sur la vie privée d'un aîné peut être perçu comme manque de respect. J'ai tout de même tenté de recruter en passant par des organismes locaux représentant des communautés Africaines particulières. Il me fut informé, par leur leadership, que le recrutement serait d'une difficulté assurée, car « les Africains n'aiment pas parler de leur santé. Pour eux, la maladie tel que le diabète est encore taboue ».

La tentative de recrutement se poursuivit dans des églises ethniques représentées, en majorité, par des membres Francophones d'origines Africaines ou Caribéennes. J'ai pu expliquer mon projet au pasteur d'une église Africaine, à Toronto. Étant un homme de science lui-même, il me donna son feu vert par rapport au recrutement, mais il m'avertit que cette démarche pourrait être difficile car « nos frères n'aiment pas parler de leur maladie ». Il me donna une suggestion excellente tout en proposant que je revienne un dimanche pour qu'il puisse m'accorder cinq minutes pour parler à sa congrégation et expliquer mon projet brièvement. Cette démarche n'a pas eu lieu comme prévu pour des causes multiples pour un

étudiant chercheur, incluant les défis financiers dus aux fréquents déplacements vers Toronto. Malgré cela, j'ai pu retourner et distribuer des pamphlets, mais sans succès. La tentative de recrutement dans une église francophone Antillaise n'a pas fonctionné, même si je connaissais le pasteur. Ce dernier ne m'accorda aucune opportunité et ne retourna aucun de mes appels multiples.

### **Le défi de l'Intégration culturelle?**

#### **La question importante demeure: Comment rejoindre cette population ?**

Les habitudes enracinées dans la culture sont difficiles à changer. Il reste que la vraie raison à la base de ce dilemme n'est pas claire. Cela justifie la nécessité d'une recherche approfondie afin d'obtenir des données factuelles sur l'intégration de ce groupe, de par sa culture, pour une participation croissante dans des recherches médicales et ainsi atténuer la dynamique du diabète au sein de cette population vulnérable.

Le défi de recrutement pour une recherche va au-delà de l'indifférence individuelle, il y a des pistes à démystifier pour mieux connaître les causes plus profondes, qui pourraient être en lien avec les rapports coloniaux liés à la recherche comme telle. Voici une nouvelle thématique pour la recherche interdisciplinaire en santé.

### **III. Recommendations and implication for future research**

Despite the fact that these interventions showed positive short term improvements in clinical and behavioural outcomes, interventions such as RCTs, and longitudinal investigations with longer follow ups over a longer period of longer period of time are needed to establish the

scalability of such research. All included studies were conducted in the province of Ontario, mostly in the city of Toronto. Despite having the most multi-cultural province in Canada, only three interventional studies, including participants of African and Caribbean origins were conducted in Ontario since 2010. Culturally sensitive research with this group should be conducted across Canada for regional variation and comparison of outcomes. Health care professionals, educators, researchers and students should increase their interest in cultural sensitive interventions to efficient and high quality patient-centered care. More research is warranted to help health care professionals in learning more about patients' cultural values for the sake of increasing integration.

Future culturally sensitive programs and interventions, in Canada, should adapt their approach to the language of African and Caribbean participants. Many of these patients speak French as a first language. Interventions should employ multilingual personnel and material. Language is intricately tied to culture (Currie et al, 2013). Studies only specified the region rather than the countries of participants. This presupposes cultural homogeneity. There exist sub-cultural differences in Africa and the Caribbean. Future studies ought to take this fact into consideration and find unifying commonalities in adapting cultural interventions.

Immigrant patients need to be met where they are at. In the event where a participant is more comfortable with a dialect, a translator would help bridge the gap. This may help increase self-confidence in the interventionist and the intervention itself and yield long-term and lasting outcomes. Future research should also include cost-effectiveness of culturally adapted interventions. The feasibility of such studies, in Canada, would largely depend on the

per-patient-cost of the intervention. Cost-effectiveness is paramount since diabetes threatens the sustainability while imposes such a heavy burden on health care costs in the Canadian economy.

#### **IV. Strengths and limitations of the review**

One notable limitation in this review is the fact that no included study was culturally adapted. This study focused on whether the interventions were culturally sensitive to African and Caribbean patients. Only a few studies seeking to affect an outcome in T2DM patients included a sample of this population. To our knowledge, this is the first review seeking to determine whether interventions are culturally sensitive to African and Caribbean T2DM patients in Canada. Patient characteristics in studies only detailed the region rather than the countries of participants. This presupposes cultural homogeneity. It is a fact that sub-cultural differences exist in such a large continent as Africa (Currie et al., 2013).

We could not definitely conclude that all patients in all studies were blinded, except for two trials, and no blinding of treatment allocation were clearly specified. There is always the chance of that these missing essentials could lead to an amplification of effect.

One out of the three-included studies was a non-randomized pilot intervention while the other two were RCTs. This imposed heterogeneity. The effectiveness of evidence-based intervention adapted to culture would also require more RCTs. This review does not give definitive answers, especially with such a small sample size, but calls for more research to

determine the effectiveness of cultural sensitive interventions on African and Caribbean T2DM patients. Studies were quantitative in nature, hence limiting the use of narrative synthesis. Yet the latter, helped with drawing concise conclusion on the need for future research.

## V. Concluding remarks

The findings of this systematic review showed an opportunity to conduct cultural sensitive interventions and research in Canada. Interventions, in this review, have shown positive in patient knowledge, behavior and outcome. However, such interventions must be culturally adapted to increase the full participation of African and Caribbean patients in Canada. As the country continues to morph into a more diverse and multicultural nation, its health care services and research should also be more culturally competent. Bhopal (2012) asserts well that despite the challenge, the pursuit for culturally competent healthcare systems in every nation, *including Canada*, requires more research to meet the growing needs of ethnic minority groups (Bhopal, 2012; *Italics' mine*).

In terms of the methodology, should parameters such as expanding the research to include the United States of America and perhaps Western Europe, or if we did expand the terms of diabetes to also include self-report rather than medical diagnosis only, we may have arrived at a different conclusion.

Another limitation of the systematic review pertains to the fact that we might find more grassroots actions that are culturally-sensitive to prevent diabetes, such as those achieved at

institutions such as the Francophone Center in Toronto, but may be absent from “fashion publications” gathered in big North American and Westernized databases. Nevertheless, this study demonstrated the lack of research and interventions that considered culture as criterion of analysis. In consideration with figure 3, this shows a problem that might be linked to postcolonial and power relationship between the researchers and the participants from Canadian African and Caribbean minorities. More researches are needed to explore in depth the colonialism integrated to research and interventions linked to T2DM interventions.

### **Conflict of interest**

There is no conflict of interest to declare.

## Appendix

Figure 2. PRISMA Flow Diagram

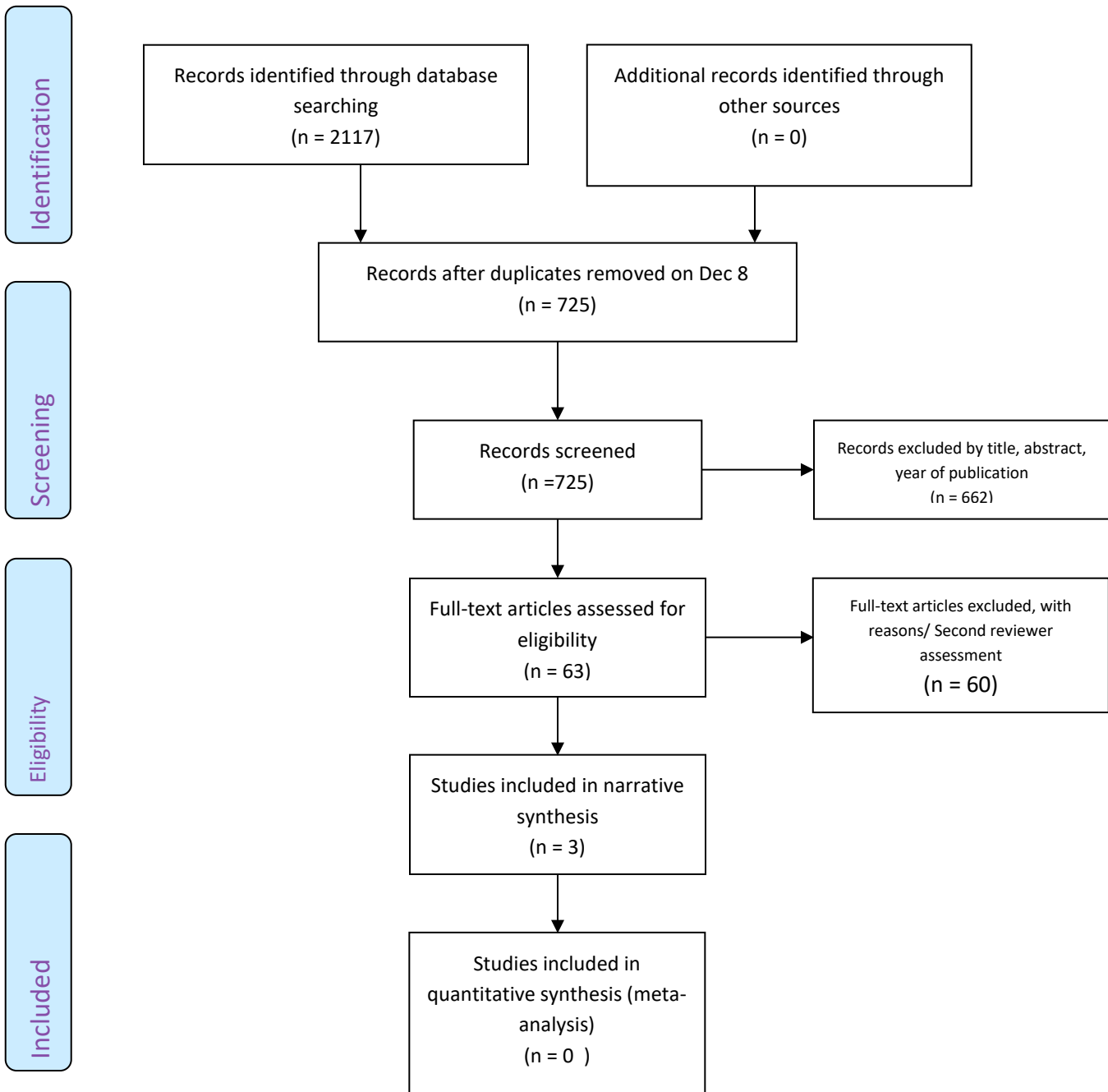


Figure 3. Pie chart of included studies

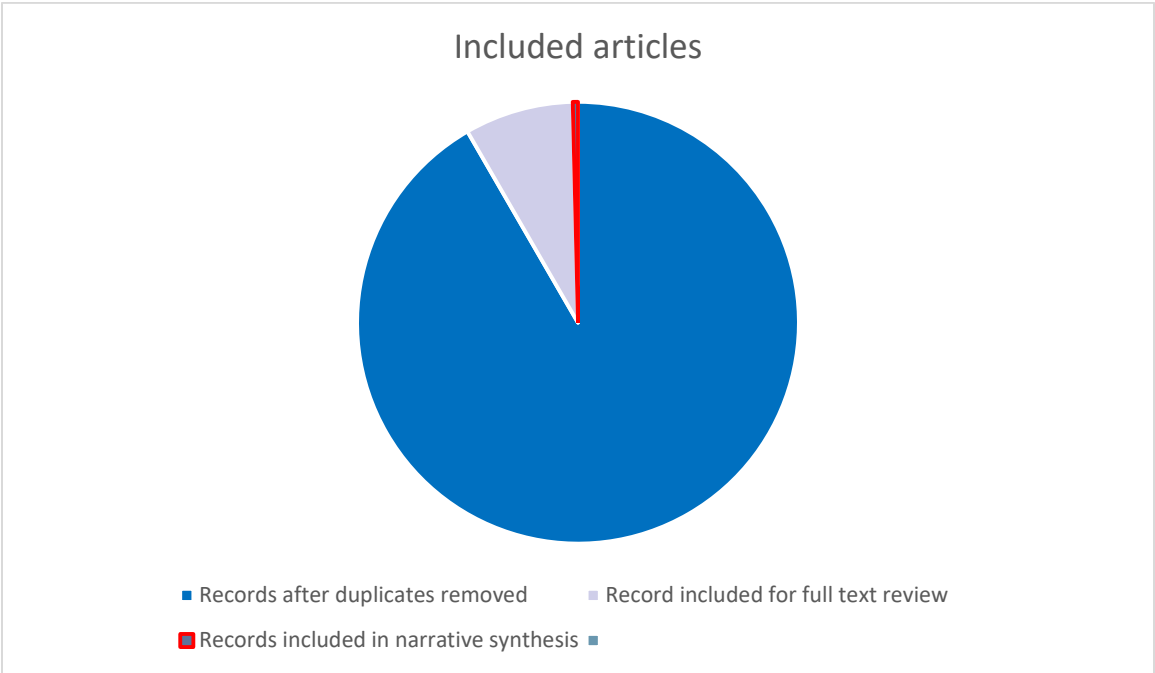
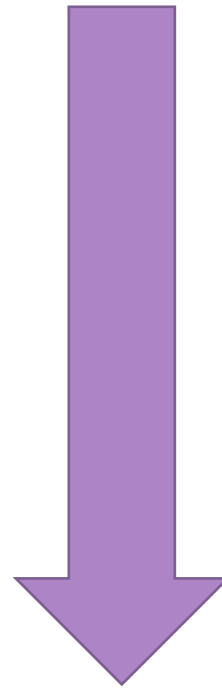


Figure 4. Steps in the systematic review process (July 2016- May 2017)



## Database search strategies

Search [history/strategy](#) from Cinahl in EBSCO Interface: **392** articles retrieved

Monday, December 12, 2016 1:01:40 PM

#	Query	Limiters/Expanders	Last Run Via	Results
S13	S8 AND S11	Limiters - Published Date: 20050101-20161231 Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S12	S8 AND S11	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S11	S9 OR S10	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S10	canad*	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S9	(MH "Canada+")	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S8	S6 OR S7	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S7	(diabetes N2 type 2) AND ( (therap* or education* or intervention* or prevention* or treatment*) )	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S6	(MH "Diabetes Mellitus, Type 2/DH/DT/ED/NU/PC/PF/RH/SU/TH")	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S5	S1 OR S2 OR S3 OR S4	Expanders - Apply related words	Interface - EBSCOhost Research Databases	Display

		Search modes - Boolean/Phrase	Search Screen - Advanced Search Database - CINAHL	
S4	TI minorit* OR AU minorit*	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S3	(MH "Minority Groups")	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S2	TI immigra* OR AB immigra*	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display
S1	(MH "Immigrants+")	Expanders - Apply related words Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL	Display

**Database(s): Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present**  
**Search Strategy:**

#	Searches	Results
1	exp Diabetes Mellitus, Type 2/dh, dt, nu, pc, px, su, th [Diet Therapy, Drug Therapy, Nursing, Prevention & Control, Psychology, Surgery, Therapy]	46579
2	(diabetes adj2 type 2).tw.	98516
3	(therap* or education* or intervention* or prevention* or treatment*).tw.	6123141
4	2 and 3	49250
5	1 or 4	74891
6	exp Canada/	148223
7	canad*.tw.	106293
8	6 or 7	194148
9	5 and 8	858
10	limit 9 to yr="2005 -Current"	705
11	exp "Emigrants and Immigrants"/	9676
12	"Emigration and Immigration"/	25595
13	immigra*.tw.	28663
14	Minority Groups/	13537
15	Minority Health/	720
16	minorit*.tw.	59449
17	11 or 12 or 13 or 14 or 15 or 16	111663
18	5 and 8 and 17	32
19	4 and 5 and 9	563

**Database(s): Embase Classic+Embase 1947 to 2016 December 09****Search Strategy:**

#	Searches	Results
1	non insulin dependent diabetes mellitus/dt, pc, rh, su, th [Drug Therapy, Prevention, Rehabilitation, Surgery, Therapy]	55601
2	(diabetes adj2 type 2).tw.	137571
3	(therap* or education* or intervention* or prevention* or treatment*).tw.	7964082
4	2 and 3	72000
5	1 or 4	104375
6	exp Canada/	169151
7	canad*.tw.	143171
8	6 or 7	225627
9	5 and 8	1211
10	limit 9 to yr="2005 -Current"	1057
11	immigrant/	16668
12	immigration/	7622
13	immigra*.tw.	31020
14	minority group/	14085
15	minority health/	785
16	minorit*.tw.	68540
17	11 or 12 or 13 or 14 or 15 or 16	107550
18	10 and 17	28
19	limit 18 to yr="2005 -Current"	28
20	4 and 5 and 9 and 10	825

**Database(s): PsycINFO 1806 to December Week 1 2016****Search Strategy:**

#	Searches	Results
1	[non insulin dependent diabetes mellitus/dt, pc, rh, su, th [Drug Therapy, Prevention, Rehabilitation, Surgery, Therapy]]	0
2	(diabetes adj2 type 2).tw.	5325
3	(therap* or education* or intervention* or prevention* or treatment*).tw.	1286998
4	2 and 3	3291
5	1 or 4	3291
6	exp Canada/	0
7	canad*.tw.	41579
8	6 or 7	41579
9	5 and 8	58
10	limit 9 to yr="2005 -Current"	52
11	immigrant/	18288
12	immigration/	18288
13	immigra*.tw.	26404
14	minority group/	0
15	minority health/	0
16	minorit*.tw.	44122
17	exp diabetes mellitus/	6854
18	diabetes.tw.	23574
19	cultural factor/	39324
20	(cultur* adj5 (tailored or sensitive or adapted or target*)).tw.	6926
21	[exp Diabetes Mellitus, Type 2/dh, dt, nu, pc, px, su, th [Diet Therapy, Drug Therapy, Nursing, Prevention & Control, Psychology, Surgery, Therapy]]	0
22	17 or 18	24095
23	5 or 21	3291
24	4 and 5 and 9 and 10 and 22 and 23	52

**Database(s):** EBM Reviews - Cochrane Database of Systematic Reviews 2005 to December 07, 2016, EBM Reviews - ACP Journal Club 1991 to November 2016, EBM Reviews - Database of Abstracts of Reviews of Effects 1st Quarter 2015, EBM Reviews - Cochrane Central Register of Controlled Trials November 2016, EBM Reviews - Cochrane Methodology Register 3rd Quarter 2012, EBM Reviews - Health Technology Assessment 4th Quarter 2016, EBM Reviews - NHS Economic Evaluation Database 1st Quarter 2015

**Search Strategy:**

#	Searches	Results
1	non insulin dependent diabetes mellitus/dt, pc, rh, su, th [Drug Therapy, Prevention, Rehabilitation, Surgery, Therapy]	88
2	(diabetes adj2 type 2).tw.	15041
3	(therap* or education* or intervention* or prevention* or treatment*).tw.	586170
4	2 and 3	11623
5	1 or 4	11655
6	exp Canada/	3427
7	canad*.tw.	12172
8	6 or 7	13926
9	5 and 8	310
10	limit 9 to yr="2005 -Current" [Limit not valid in DARE; records were retained]	285
11	immigrant/	132
12	immigration/	75
13	immigra*.tw.	460
14	minority group/	257
15	minority health/	15
16	minorit*.tw.	3717
17	exp diabetes mellitus/	18089
18	diabetes.tw.	36441
19	cultural factor/	0
20	(cultur* adj5 (tailored or sensitive or adapted or target*)).tw.	953
21	exp Diabetes Mellitus, Type 2/dh, dt, nu, pc, px, su, th [Diet Therapy, Drug Therapy, Nursing, Prevention & Control, Psychology, Surgery, Therapy]	366
22	5 or 21	11713
23	4 and 5 and 9 and 10 and 22	285

## **Abstract of included studies**

**Fan, L., Sidani, S., Cooper-Brathwaite, A., & Metcalfe, K. (2014). Improving Foot Self-Care Knowledge, Self-Efficacy, and Behaviors in Patients with type 2 Diabetes at Low Risk for Foot Ulceration: A Pilot Study. Clinical Nursing Research, 23 (6), 627-643.**

**The pilot study aimed to explore the effects of an educational intervention on patients' foot self-care knowledge, self-efficacy, and behaviors in adult patients with type 2 diabetes at low risk for foot ulceration. The intervention consisted of three sessions and was given over a 3-week period. A total of 70 eligible consenting participants were recruited for this pilot study. Fifty-six participants completed the study. The outcomes were assessed at pretest, following the first two sessions, and 3-month follow-up. The findings indicated that the foot self-care educational intervention was effective in improving foot self-care knowledge, self-efficacy and behaviors in adult patients with type 2 diabetes at low risk for foot ulceration. The findings support the effects of the intervention. Future research should evaluate its efficacy using a randomized clinical trial design, and a large sample of patients with type 2 diabetes at low risk for foot ulcerations.**

Jenkins, D. A., Kendall, C. C., Vuksan, V., Faulkner, D., Augustin, L. A., Mitchell, S., & Josse, R. G. (2014). Effect of lowering the glycemic load with canola oil on glycemic control and cardiovascular risk factors: a randomized controlled trial. *Diabetes Care*, 37(7), 1806-1814. doi:10.2337/dc13-2990

**OBJECTIVE** Despite their independent cardiovascular disease (CVD) advantages, effects of  $\alpha$ -linolenic acid (ALA), monounsaturated fatty acid (MUFA), and low-glycemic-load (GL) diets have not been assessed in combination. We therefore determined the combined effect of ALA, MUFA, and low GL on glycemic control and CVD risk factors in type 2 diabetes.

**RESEARCH DESIGN AND METHODS** The study was a parallel design, randomized trial wherein each 3-month treatment was conducted in a Canadian academic center between March 2011 and September 2012 and involved 141 participants with type 2 diabetes (HbA<sub>1c</sub> 6.5%–8.5% [48–69 mmol/mol]) treated with oral antihyperglycemic agents. Participants were provided with dietary advice on either a low-GL diet with ALA and MUFA given as a canola oil–enriched bread supplement (31 g canola oil per 2,000 kcal) (test) or a whole-grain diet with a whole-wheat bread supplement (control). The primary outcome was HbA<sub>1c</sub> change. Secondary outcomes included calculated Framingham CVD risk score and reactive hyperemia index (RHI) ratio.

**RESULTS** Seventy-nine percent of the test group and 90% of the control group completed the trial. The test diet reduction in HbA<sub>1c</sub> units of  $-0.47\%$  ( $-5.15$  mmol/mol) (95% CI  $-0.54\%$  to  $-0.40\%$  [ $-5.92$  to  $-4.38$  mmol/mol]) was greater than that for the control diet ( $-0.31\%$  [ $-3.44$  mmol/mol] [95% CI  $-0.38\%$  to  $-0.25\%$  ( $-4.17$  to  $-2.71$  mmol/mol)],  $P = 0.002$ ), with the greatest benefit observed in those with higher systolic blood pressure (SBP). Greater reductions were seen in CVD risk score for the test diet, whereas the RHI ratio increased for the control diet.

**CONCLUSIONS** A canola oil-enriched low-GL diet improved glycemic control in type 2 diabetes, particularly in participants with raised SBP, whereas whole grains improved vascular reactivity.

**Background:** Adoptions of health behaviors are crucial for maintaining good health after type 2 diabetes mellitus (T2DM) diagnoses. However, adherence to glucoregulating behaviors like regular exercise and balanced diet can be challenging, especially for people living in lower-socioeconomic status (SES) communities. Providing cost-effective interventions that improve self-management is important for improving quality of life and the sustainability of health care systems.

**Objective:** To evaluate a health coach intervention with and without the use of mobile phones to support health behavior change in patients with type 2 diabetes.

**Methods:** In this noninferiority, pragmatic randomized controlled trial (RCT), patients from two primary care health centers in Toronto, Canada, with type 2 diabetes and a glycated hemoglobin/hemoglobin A1c (HbA1c) level of  $\geq 7.3\%$  (56.3 mmol/mol) were randomized to receive 6 months of health coaching with or without mobile phone monitoring support. We hypothesized that both approaches would result in significant HbA1c reductions, although health coaching with mobile phone monitoring would result in significantly larger effects. Participants were evaluated at baseline, 3 months, and 6 months. The primary outcome was the change in HbA1c from baseline to 6 months (difference between and within groups). Other outcomes included weight, waist circumference, body mass index (BMI), satisfaction with life, depression and anxiety (Hospital Anxiety and Depression Scale [HADS]), positive and negative affect (Positive and Negative Affect Schedule [PANAS]), and quality of life (Short Form Health Survey-12 [SF-12]).

**Results:** A total of 138 patients were randomized and 7 were excluded for a substudy; of the remaining 131, 67 were allocated to the intervention group and 64 to the control group. Primary outcome data were available for 97 participants (74.0%). While both groups reduced their HbA1c levels, there were no significant between-group differences in change of HbA1c at 6 months using intention-to-treat (last observation carried forward [LOCF]) ( $P=.48$ ) or per-protocol ( $P=.83$ ) principles. However, the intervention group did achieve an accelerated HbA1c reduction, leading to a significant between-group difference at 3 months ( $P=.03$ ). This difference was reduced at the 6-month follow-up as the control group continued to improve, achieving a reduction of 0.81% (8.9 mmol/mol) ( $P=.001$ ) compared with a reduction of 0.84% (9.2 mmol/mol) ( $P=.001$ ) in the intervention group. Intervention group participants also had significant decreases in weight ( $P=.006$ ) and waist circumference ( $P=.01$ ) while controls did not. Both groups reported improvements in mood, satisfaction with life, and quality of life.

**Conclusions:** Health coaching with and without access to mobile technology appeared to improve glucoregulation and mental health in a lower-SES, T2DM population. The accelerated improvement in the mobile phone group suggests the connectivity provided may more quickly improve adoption and adherence to health behaviors within a clinical diabetes management program. Overall, health coaching in primary care appears to lead to significant benefits for patients from lower-SES communities with poorly controlled type 2 diabetes.

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