EXPLORING BARRIERS AND FACILITATORS TO CLINICAL PRACTICE GUIDELINE APPLICATION IN MEXICAN MUTUAL AID GROUPS

by

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Abstract

Introduction: The rate of lifestyle induced chronic diseases has increased rapidly over the last few decades. Diseases related to obesity such as Type 2 Diabetes, cardiovascular disease, and hypertension, have become leading causes of death worldwide. The effect of these diseases is becoming increasingly apparent in low and middle-income countries such as Mexico. In response to the rise in obesity and non-communicable diseases, the Mexican government enacted a policy called the Grupos de Ayuda Mutua (GAM), which looks to treat, manage, and prevent chronic diseases. A GAM is a peer-support group of patients with lifestyle-induced chronic diseases that receive guidance and oversight by a multidisciplinary group of health professionals. The health professionals are guided by evidence-based clinical practice guidelines (CPGs) to provide the best quality of care to their patients, however, when CPGs are applied in real world contexts, unforeseen challenges to adherence and application are observed (Larme & Pugh, 2001). Purpose: The purpose of this study is to explore the barriers and facilitators to CPG application from the perspective of physicians in Mexican GAMs. Methods: Working in collaboration with the Secretariat of Health in Jalisco, physicians (n = 24) were recruited to participate in semi-structured interviews, which were guided by the Clinical Practice Guideline Framework for Improvement (Cabana et al., 1999). Deductive thematic analysis was conducted to identify themes from the physician verbatim. Inductive analysis was used to identify facilitators to CPG application and recommendations from participants regarding how the GAMs and application of CPGs could be improved. Results: Physicians identified a variety of barriers and facilitators to CPG application in the GAMs. Barriers included lack of medication, lack of regional guidance, institutional culture, and more. Facilitators included creativity, seeing results, choosing the “right” patients, and more. Discussion: This study is one of the first to explore barriers and facilitators to CPG application in GAMs. Recommendations and considerations from participants on how the GAMs and application of CPGs could be improved are also reported. Study findings can be used by state health officials to improve the GAM strategy and facilitate the use of evidence-based methods in the GAMs.
Co-Authorship

This thesis, titled *Exploring Barriers and Facilitators to Clinical Practice Guideline Application in Mexican Mutual Aid Groups*, is the work of Carla Teixeira under the supervision of Dr. Lucie Lévesque. The conceptualization of this thesis was a collaborative effort between Carla Teixeira, Lucie Lévesque, Edtna Jauregui-Ulloa, and Esmeralda Gonzalez-Navarro. Carla Teixeira conducted the literature review, conducted the data collection through semi-structured interviews, qualitative analyses, interpretation of results, and writing of the chapters. Lucie Lévesque and Edtna Jauregui-Ulloa provided ongoing feedback and guidance, and Lucie Lévesque assisted in editing the thesis.
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List of Abbreviations

GAM – Grupos de Ayuda Mutua; Mutal Aid Groups

SSJ – Secretaria de Salud de Jalisco; Secretariat of Health of Jalisco

INSP – Instituto Nacional de Salud Publica; Mexican National Institute of Health

T2D - Type 2 Diabetes

CVD – Cardiovascular Disease

CPG – Clinical Practice Guideline

LMIC – Low-to-Middle Income Country

NCD – Non-Communicable Disease

CPGFI – Clinical Practice Guideline Framework for Improvement
Prologue

As a Peruvian-born, United States-raised, Canada-based student doing research in Mexico, this project has challenged me in ways I could not have imagined. I have questioned my identity, my background, my ethical standing, and my capabilities as a researcher. Having grown up in an American setting, with American values, I knew that it would be different to work in a Latin-American context. I went into this project with an open mind and looked forward to learning from our Mexican colleagues.

Living in Mexico, I soon realized the advantages of having dark skin and being bilingual because I was able to blend in with those around me and to experience what it is like to live in Mexico. I could interact with Secretariat of Health of Jalisco (SSJ) officials, ask questions, and understand conversations that allowed me to gather a greater understanding of the Mexican health system. I had the unique opportunity to be around state officials while also being around regular people who were impacted by the work done at the SSJ. It was an illuminating experience where I could see multiple realities that are at play and influencing health at various levels. Having conversations with people on the bus, becoming friends with local activists, eating at the taco stands, and observing the dynamics at the SSJ; all of these experiences, and more, helped me shape an understanding of the complex factors that can affect the health of individuals.

While designing this project, I understood how crucial it was to have the perspective of our research partners at the SSJ as they had the connections and insider knowledge needed to carry out this project. It was also really important to design a project that would be useful and beneficial to them. Working alongside SSJ officials was a learning opportunity that taught me many valuable lessons about what is required to move forward a national strategy and promote the health and wellbeing of all. Travelling to the different health centres in Jalisco was another way in which I was able to see the varying socioeconomic circumstances within the state, and even within the metropolitan area of a city. Talking to participating physicians and visiting their health centres allowed me to see the conditions of
their working spaces and the resources that are available to them, painting a picture of what they were saying during our interviews.

Throughout my time in Mexico, I reflected upon my interactions with physicians, SSJ officials, and locals. I tried to put together all the comments, experiences, and stories that I heard every day and to figure out how they fit with each other. I was also mindful of how I presented myself and how I spoke with everyone, particularly, participating physicians as I knew that I was an active participant in the research and that my presence could affect the data that were collected. Because I was representing the SSJ during data collection, I was instructed to wear a white coat when visiting the health centres to add formality to the interaction. While I was not comfortable with this decision, I understood that in the context in which the research was taking place, image and presentation are extremely important and I had to comply. I tried to always be mindful of how my appearance might be impacting the data collection and what was said during interviews. Although wearing the SSJ affiliated white coat likely enabled me to shed the student label and be taken more seriously, it might also have caused interviewed physicians to be less forthcoming with information for fear of repercussions from the SSJ.

Keeping in mind my personal beliefs and cultural background, and how these can affect the research process, I was conscious of my subjectivity throughout the data collection, analysis, and writing of this thesis. For these reasons, I enlisted the help of critical friends who would question my reasoning and increase study rigour; who would give me insights and increase my understanding of the phenomenon I was studying. Throughout the process of writing this thesis, I reflected on how my own voice and ideas are intertwined with the data and have tried to present an account that is truly a reflection of the story told to me by those I interviewed.
Chapter 1

Introduction

1.1 Background Information

Obesity and non-communicable disease rates around the world are increasing (WHO, 2017). Non-communicable diseases, such as Type 2 Diabetes (T2D), cardiovascular disease (CVD), and hypertension have become prominent causes of death worldwide and are a serious public health concern. In low-and-middle-income-countries (LMICs), the impact of these diseases is rapidly increasing and surpassing that of developed countries (Márquez-Sandoval et al., 2011; Pena & Bloomfield, 2015). The situation of LMICs is particularly disconcerting as these countries find themselves “double burdened” with the task of combatting these lifestyle diseases alongside persistent rates of hunger and infectious diseases (Arredondo, Zúñiga, & Parada, 2005).

Mexico in particular, is experiencing some of the highest rates of obesity in the world (INSP, 2016). Diabetes rates have skyrocketed and become one of the most prevalent causes of death (Barquera et al., 2013; Villalpando et al., 2010). According to a survey by the Mexican National Institute of Public Health (INSP), one in four Mexican adults has hypertension, putting these adults at risk for CVD (INSP, 2016).

Much of the increase of obesity in Mexican adults can be attributed to the increase in consumption of sugar sweetened beverages and processed foods, which have become staples in the Mexican diet (Rivera, Barquera, González-Cossío, Olaiz, & Sepúlveda, 2004; Stern, Piernas, Barquera, Rivera, & Popkin, 2014). Lower physical activity levels, as per the physical activity transition in which the rapid urbanization and the advancement of technology have diminished dependence on physical activity for survival (e.g. hunting and gathering), also contribute to the rising prevalence of obesity related diseases (Katzmarzyk & Mason, 2009).
In clinical settings, evidence-based treatments for these non-communicable diseases include healthy nutrition and physical activity, education, peer support, and medication adherence (Greaves et al., 2011; Heisler, Vijan, Makki, & Piette, 2010; Lorig, Ritter, Villa, & Armas, 2009; Sokol, McGuigan, Verbrugge, & Epstein, 2005). These recommendations are based on research that is systematically reviewed and compiled as clinical practice guidelines (CPGs) to provide a collection of evidence-based strategies for treatments (Turner, Misso, Harris, & Green, 2008). Thus, CPGs are a tool used to translate research findings into the real world. In clinical settings CPGs have been shown to improve quality of care (Lugtenberg, Burgers, & Westert, 2009; Woolf, Grol, Hutchinson, Eccles, & Grimshaw, 1999). However, application of CPGs does not guarantee better health for patients, as some studies report little to no relationship between CPG use and health outcomes (Wesselink, Lingsma, Robben, & Mackenbach, 2015; Worrall, Chaulk, & Freake, 1997).

The process known as knowledge translation (KT) involves the creation, dissemination, and utilization of new knowledge traditionally produced by research (Straus, Tetroe, & Graham, 2009a). There are multiple ways to make sure that new knowledge reaches knowledge users. Researchers can report their findings at the end of a research project and make them available to knowledge users through presentations and publications, or knowledge users can be involved earlier in the process, helping to develop, implement and evaluate the use of knowledge (Canadian Institutes of Health Research, 2012). KT is especially important for LMICs given the pervasiveness of global health disparities despite the availability of evidence to address most health problems (Cordero et al., 2008; Gwatkin, 2003; Neufeld, MacLeod, Tugwell, Zakus, & Zarowsky, 2001).

While evidence-based strategies (e.g. CPGs) can facilitate good practice in clinical settings, there are often barriers to the application of CPGs in a real-world context (Larme & Pugh, 2001). Studies highlight that attitudes, self-efficacy, lack of support, and more, are barriers to the use of CPGs in clinical settings (Cabana et al., 1999; Larme & Pugh, 2001; Martin, Williams, Haskard, & DiMatteo, 2005). In addition, there can be high financial demands to bridging the gap between
knowledge creation, dissemination, application, and evaluation, which can create significant challenges for low-resourced LMICs (Santesso & Tugwell, 2006).

1.2 Thesis Study

This research took place in Jalisco, Mexico. Jalisco is the fourth largest state in Mexico with a population of over 7.5 million people living within its borders (Jalisco, Mexico, 2015). The Secretariat of Health of Jalisco (SSJ) is the main entity in the state that aims to better the health status of all Jalisco residents with “services based on equity, quality and humanity and with community participation” (“¿Qué hacemos? | Secretaría de Salud,” n.d.). Jalisco is divided into 13 health regions with local SSJ representation in each region led by a regional coordination team. Additionally, Jalisco is a good representation of Mexico because approximately 87% of the population lives in urban areas, 51% are women, and the average level of education is nine years; these measures are similar to national estimates (INEGI, 2010). As with the rest of Mexico, the two main causes of death in Jalisco are T2D and CVD, making these NCDs a priority to treat and manage (Secretaria de Salud, 2013).

Mexico has a national policy which aims to prevent, treat, and manage T2D, hypertension, CVD, and dyslipidemia called the Grupos de Ayuda Mutua (GAM; Mutual Aid Groups; Programa de Salud en el Adulto y en el Anciano & CENAPRECE, 2017). A GAM consists of a group of patients with non-communicable diseases receiving education and medical care from a multidisciplinary team of health professionals. GAMs are found in all health centres and, in Jalisco, there are 222 active GAMs that are supported by the SSJ in their efforts to treat T2D and other obesity-related diseases (E. Gonzalez-Navarro, Personal Communication, October 24, 2016).

1.3 Purpose of Study

While barriers to CPG application have been investigated in clinical settings for the purposes of designing effective interventions to change physician behaviours (Cabana et al., 1999), there is no study that explores this phenomenon in the GAMs. Thus, the purpose of this study is to explore the barriers and facilitators to CPG application from the perspective of physicians working in the GAMs.
The primary aim of this study is to identify the barriers and facilitators so that barriers to CPG application can be addressed and facilitators enhanced, increasing the likelihood of evidence-based practices within GAMs. By obtaining the perspective of physicians working in the GAMs, a set of recommendations can be gathered from those working within the strategy to improve the effectiveness of the GAMs. An integrated knowledge translation approach, in which state officials from the SSJ were involved in the research process, was used to carry out this study.

1.4 Overview of Thesis

This thesis was written in accordance with the manuscript format requirements of the School of Kinesiology and Health Studies at Queen’s University. Chapter two provides an overview of obesity and non-communicable diseases worldwide, the impact of these diseases in LMICs, specifically Mexico, an exploration of the Mexican health care system and Mexican strategies for obesity management, a description of the GAM policy, evidence-based treatments for obesity and related diseases, and knowledge translation. Chapter two ends with a description of barriers to KT, the study rationale, and purpose of the study. Chapter three, a manuscript titled “Exploring Barriers and Facilitators to Clinical Practice Guideline Application in Mexican Mutual Aid Groups”, reports the methodology, analysis and findings of the study to identify the barriers and facilitators to CPG application in the GAMs. Chapter four is the general discussion in which study findings, strengths, limitations, and implications are summarized and future directions for research on the GAMs is described.
1.5 References


Chapter 2

Literature Review

2.1 Obesity and Related Diseases

Increasing obesity and overweight are a global health concern (WHO, 2016). In 2014, 1.9 billion adults had overweight and 600 million of these had obesity. Today, the majority of people live in a country with higher mortality attributable to obesity related conditions rather than undernutrition (WHO, 2016).

2.1.1 Diabetes

Diabetes is a condition composed of a group of metabolic diseases, generally resulting from increased glucose levels in the blood stream (National Diabetes Data Group, 1979). Criteria for the diagnosis of diabetes include 1) fasting plasma glucose greater than or equal to 7.0 mmol/L, or 2) A1C (glycated hemoglobin used to identify the three-month average plasma glucose concentration) levels greater than or equal to 6.5%, or 3) a two hour plasma glucose oral glucose tolerance test level greater than or equal to 11.1 mmol/L, or 4) a random plasma glucose level greater than or equal to 11.1 mmol/L (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, 2013). Ideally, two tests will be performed to confirm the diagnosis of diabetes. These criteria for diagnosis are similar in the rest of North America (American Diabetes Association, 2010; CENETEC, 2012).

The most prevalent type of diabetes is Type 2 Diabetes (T2D), also called non-insulin-dependent or adult-onset diabetes; it accounts for approximately 90-95% of cases of diabetes worldwide (American Diabetes Association, 2010). T2D is a lifestyle induced disease comprised of a group of metabolic conditions, generally resulting from increased glucose levels in the blood stream due to insulin resistance. Insulin resistance is a condition in which secreted insulin is not used effectively, leading to reduced glucose absorption in the cells and increased glucose build up in the
blood stream. Over time, if left untreated, elevated blood glucose can lead to a variety of metabolic diseases, including T2D. Patients with T2D have insulin resistance and relative insulin deficiency, however, most do not need an insulin treatment to survive (Weyer, Bogardus, Mott, & Pratley, 1999).

As a global health burden, T2D affects approximately 370 million people (International Diabetes Federation, 2015). In 2015, diabetes caused 5 million deaths worldwide, making it and its complications major causes of death in most countries. The International Diabetes Federation (2015) estimates that 193 million people living with diabetes are undiagnosed, increasing their risk for developing further complications as they are unaware of their health condition.

2.1.2 Other Obesity Related Diseases

Cardiovascular disease, hypertension, dyslipidemia, and metabolic syndrome are other prominent diseases related to obesity and diabetes. Cardiovascular disease (CVD) is composed of different disorders of the heart and blood vessels (e.g. coronary heart disease, congenital heart disease, etc.) and is currently the most common cause of death worldwide. Approximately 17.5 million people die each year from CVDs, mostly from heart attacks and strokes (WHO, 2017). Hypertension is characterized by raised blood pressure levels (140 mmHg for systolic BP and 90 mmHg for diastolic BP), is a risk factor for the development of CVD, and is one of the leading causes of death worldwide (Mills et al., 2016). Stroke, damage to the brain caused by reduced blood flow due to build up in arteries, is the second most common cause of death globally (Mozaffarian et al., 2014). While rates of death due to stroke have decreased between 1990 and 2010, recurrent stroke rates have increased (Mozaffarian et al., 2014). Dyslipidemia is characterized by an elevated lipid level in the blood and is one of the risk factors for developing metabolic syndrome and some cancers (Chen & Tseng, 2013; O’Neill & O’Driscoll, 2015). Metabolic syndrome is a multiplex risk factor that consists of dyslipidemia, elevated BP and glucose, and increased levels of adipose tissue (Grundy, 2008; O’Neill & O’Driscoll, 2015). Together, these obesity-related diseases account for some of the most prevalent
causes of death around the world, and in low-to-middle income countries the impact of these non-communicable diseases is alarming.

2.2 Obesity in Low-to-Middle Income Countries (LMICs)

Economic growth in developing countries is often accompanied with a shift in the cause of death from infectious diseases to lifestyle based diseases (McKeown, 2009). Changing nutrition and physical activity habits have contributed to increasing obesity and related diseases in LMICs. Rates of metabolic syndrome are higher in LMICs than they are in developed countries (Márquez-Sandoval et al., 2011). Diabetes and CVD rates are particularly alarming as 75% of adults with diabetes live in LMICs and 80% of CVD deaths occur in LMICs (International Diabetes Federation, 2015; Pena & Bloomfield, 2015).

Although obesity and related diseases are associated with an overconsumption of unhealthy foods and lack of physical activity, LMICs are facing persistent rates of hunger and malnutrition, co-occurring with increasing obesity and non-communicable diseases (Arredondo, Zúñiga, & Parada, 2005; Barquera et al., 2013; Prentice, 2006). This double burden of disease presents a phenomenon in which underweight children living in the same household as overweight adults can be a reality (Caballero, 2005). The availability of cheap, energy dense foods, rather than the unavailability of food, is driving higher energy intake which contributes to rising obesity. Moving from a rural to an urban area has also been found to increase the likelihood of obesity in LMICs (Caballero, 2005). Those who live in poverty are particularly affected by these non-communicable diseases (Beaglehole et al., 2011), which can further drive them into poverty as they may not have the necessary resources to receive quality care, causing their health to deteriorate (Pena & Bloomfield, 2015).

2.2.1 Obesity in Mexico

In 2016, results from a survey conducted by the Mexican National Institute of Public Health (INSP) showed that 72.5% of adults had overweight or had obesity (INSP, 2016). As part of the
nutrition transition, processed and fried foods along with sugar sweetened beverages are now a staple of the Mexican diet (Rivera et al., 2004; Stern et al., 2014). Lower physical activity levels, as per the physical activity transition in which the rapid urbanization and the advancement of technology have diminished dependence on physical activity for survival (e.g. hunting and gathering), also contribute to the rising prevalence of obesity related diseases (Katzmarzyk & Mason, 2009). Although in 2012 Mexican national survey results showed that over 80% of adults (ages 19-69) were meeting the physical activity recommendations outlined by the WHO (INSP, 2012), it is important to note that self-reported physical activity typically yields inflated prevalence as compared to directly measured physical activity (Prince et al., 2008). Thus, we can assume that actual physical activity prevalence among Mexican adults is likely much lower than that captured by the Mexican national survey.

Diabetes and related diseases in Mexico have skyrocketed, with diabetes becoming one of the most prevalent causes of death in the country (Barquera et al., 2013; Villalpando et al., 2010). In 2012, the prevalence of diagnosed diabetes in Mexico was 9.2%, increasing to 9.4% in 2016 (INSP, 2016). However, because approximately half of all diabetes cases go undiagnosed, it can be assumed that the prevalence of diabetes is much higher (Beagley, Guariguata, Weil, & Motala, 2014). Moreover, one in four Mexican adults has hypertension, which puts them at greater risk for CVD (INSP, 2016). In 2012, T2D, CVD, and obesity related issues were the second most common reasons for seeking medical attention as cited by adults younger than 50 years old; in adults 50 years old and older, these non-communicable diseases were the number one reason for seeking medical attention (INSP, 2012).

Elderly Mexicans participating in a study exploring barriers to T2D control mentioned that their eating and physical activity habits were unlikely to change because they had lived that way for so long (Montiel Carbajal & Domínguez Guedea, 2011). They also discussed how the role of food (healthy and unhealthy) is central to social gatherings, which can make it difficult to maintain a healthy diet and adequate portion control. Additionally, they pointed out the lack of access to healthy foods and medications as a barrier for managing their T2D (Montiel Carbajal & Domínguez Guedea, 2011).
2.3 Mexican Context

2.3.1 Mexican Health Care System

The health care system in Mexico is composed of three main entities: Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (Institute of Security and Social Services for State Employees; ISSSTE), Instituto Mexicano del Seguro Social (Mexican Institute of Social Security; IMSS), and Seguro Popular (Public Insurance). Approximately 48.3 million people who are formally employed or retired, and their families, receive health services through the ISSSTE or IMSS. The ISSSTE provides health insurance to approximately 9.6 million people in this group. Specifically, to state employees belonging to certain governmental offices such as the Petroleros Mexicanos (Mexican Petroleum, PEMEX), the Secretaria de Defensa (Secretary of Defense, SEDENA) and others. The IMSS provides health insurance to the remaining 38.7 million people who are formally employed (Gómez Dantés et al., 2011). Seguro Popular, on the other hand, is voluntary public health insurance available to all who are self-employed, informally employed, or unemployed. Before its initiation, at least 48% of people in Mexico were uninsured. Following a congressional reform to address inequity in health care (Gómez Dantés et al., 2011), that number dropped to 21% by 2012 due to an increased adoption of Seguro Popular (López, Valle, & Aguilera, 2015).

2.3.2 Recent Mexican Public Health Policies

There is strong evidence that government policy has an important role to play in the prevention of chronic diseases and promotion of health (Ackermann et al., 2015). In recent years, the Mexican government has implemented various policies and strategies with the aim of preventing chronic diseases by encouraging healthy behaviours. Dietary and physical activity guidelines were developed by an interdisciplinary team of national experts and external advisors to provide recommendations for healthy living (Pérez-Escamilla, 2016). Nutrition recommendations were then disseminated to the public as the Jarra de Buen Beber (Healthy Beverage Pitcher) and the Plato de Buen Comer (Healthy Food Plate; Barquera, Campos, & Rivera, 2013). The Acuerdo Nacional por la Salud Alimentaria...
(National Agreement for Healthy Nutrition; ANSA), outlined ten objectives to address obesity which included school guidelines for foods and beverages, food labeling changes, a soda tax, and more (Barquera et al., 2013). In addition, the *Grupos de Ayuda Mutua* (GAM; Mutual Aid Groups) were created as a strategy to address the rising rates of T2D and obesity related diseases through a combination of education, multidisciplinary health care, and peer support (Programa de Salud en el Adulto y en el Anciano & CENAPRECE, 2017).

### 2.3.3 Grupos de Ayuda Mutua

The GAMs became an official policy in a number of Mexican states in the early 2000s. They represent a rebranding of the *Club de Diabeticos* (Club for Diabetics) that had existed in Mexico since the early 1990s. The GAMs consist of a multidisciplinary group of health professionals (i.e. physician, nurse, dietitian, psychologist, physical activity specialist) who are guided by evidence-based clinical practice guidelines (CPG) to work with a group of patients with diabetes and/or other chronic diseases (e.g. hypertension, dyslipidemia; Programa de Salud en el Adulto y en el Anciano & CENAPRECE, 2017). GAMs exist in each of the 31 states and the Federal District of Mexico. In the state of Jalisco, there are 222 active GAMs.

Each Seguro Popular health centre is required to have a GAM. A new GAM is formed when a GAM coordinator (usually a health professional from each health centre) is designated to recruit patients and to be responsible for coordinating the GAM meetings (Programa de Salud en el Adulto y en el Anciano & CENAPRECE, 2017). Each GAM is supposed to have 20-25 patients who are over 20 years old, have *Seguro Popular*, and choose to commit to lifestyle changes to improve their health. Once enough patients have been recruited, a constitution is drafted stating the name of the GAM, identifying the patients that belong to it, and the medical team that will be affiliated with it. Patients pick a president, secretary, and treasurer to make up a board of directors. Once the constitution and patient information has been inputted into the government database, SIVEGAM, the GAM is considered “active” (Programa de Salud en el Adulto y en el Anciano & CENAPRECE, 2017). A
unique feature of the GAMs is that membership is perpetual; patients are welcome to stay with their GAM for as long as they like, even when they are successfully managing their condition. While patients belong to only one GAM at a time, health professionals may be affiliated with multiple GAMs.

GAM group meetings are scheduled at least once a month, however, some may meet weekly, others bi-weekly, etc., depending on the availability of patients and health staff. The GAM must meet at least once a month so that clinical measures (e.g. glucose levels, blood pressure, etc.) can be taken and uploaded to SIVEGAM in order to track patient progress and act as a basis for accreditation. Patients get together to engage in physical activity facilitated by the physical activity specialist and to share a healthy meal. At these gatherings, they might also receive a lesson on nutrition by the nutritionist, receive advice about emotional stability by the GAM psychologist, receive medical attention from the physician, etc. Some health centres have a multidisciplinary team on site, some receive multidisciplinary care from the mobile health team that comes from the regional offices. Sometimes the multidisciplinary team is in charge of taking clinical measures, inputting them into SIVEGAM, and monitoring GAM progress.

Once patients meet a set of clinical criteria (Table 1) for four consecutive months based on their monthly measurements, the GAM coordinator contacts state officials at the Secretaria de Salud (Secretariat of Health, SS) of their state and requests an accreditation for their GAM. There are three levels of accreditation: accredited GAMs, re-accredited GAMs, and GAMs accredited for excellence. At each level of accreditation, the clinical criteria become a bit stricter. For example, a GAM achieving an accreditation for excellence, would have to continuously show that the patients are successfully managing their chronic disease. Accreditation status is determined by SS officials who review SIVEGAM data to confirm that 80-85% of GAM members have met the criteria for four consecutive months. Once that has been confirmed, a ceremony is scheduled where participating GAM members and health professionals are recognized by regional and state health officials for their
successful efforts. The same process occurs at all three levels of accreditation, but to maintain each accredited status, a GAM must continue to meet the required criteria or they risk losing their accreditation.

**Table 1: Accreditation Criteria for GAMs**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Accreditation</th>
<th>Re-Accreditation</th>
<th>Accreditation for Excellence</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of participants attending</td>
<td>85%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Body Weight</td>
<td>% body weight reduction from baseline</td>
<td>% body weight reduction from baseline</td>
<td>% body weight reduction from baseline</td>
</tr>
<tr>
<td>Waist Circumference</td>
<td>cm reduction from baseline</td>
<td>cm reduction from baseline</td>
<td>cm reduction from baseline</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>&lt;140/90 mm/Hg</td>
<td>&lt;130/80 mm/Hg</td>
<td>&lt;130/80 mm/Hg</td>
</tr>
<tr>
<td>Fasting Glucose</td>
<td>&lt;130 mg/dl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c level</td>
<td>% HbA1c (Optional)</td>
<td>&lt;7% HbA1c</td>
<td>&lt;7% HbA1c</td>
</tr>
</tbody>
</table>

**OPTIONAL VARIABLES**

<table>
<thead>
<tr>
<th>Total Cholesterol (Optional)</th>
<th>200-240 mg/dl</th>
<th>200-240 mg/dl</th>
<th>&lt;200 mg/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triglycerides (Optional)</td>
<td>150-199 mg/dl</td>
<td>150-199 mg/dl</td>
<td>&lt;150 mg/dl</td>
</tr>
</tbody>
</table>

(Problema de Salud en el Adulto y en el Anciano & CENAPRECE, 2017)

While GAMs are supposed to be composed of 20-25 patients, there are times when health professionals see that the need far exceeds the capacity. In fact, only 15% of people diagnosed with a chronic disease attend a GAM (E. Gonzalez-Navarro, personal communication, October 24, 2016).

Reasons for not belonging to a GAM can vary; patients might not have time to attend regularly, patients deny that they have a chronic disease, or the location of the nearest GAM might be inconvenient. Some health centres with a GAM are overwhelmed by the number of patients who want to join, but cannot commit to the regular GAM meetings. For these patients, some GAM coordinators
set up a few “unofficial” GAMs that allow patients to attend when they are able to. For these
“unofficial” patients, the traditional GAM processes may or may not apply.

Thus far, the few studies that have been published about the impact of GAMs on patient health report mixed results. Lara Esqueda and colleagues reported that patients who attend the GAMs are more likely to have their health condition (diabetes or hypertension) under control compared to those who do not attend the GAMs, as assessed via chart review (2004). Another cross sectional study found no difference in chart recorded glycemic levels or body mass index of T2D patients who regularly attended a GAM from May to November of 2004 compared to directly measured glycemic levels and body mass index from patients who did not attend a GAM (Muñoz-Reyna, Ocampo-Barrio, & Quiroz-Pérez, 2007). Although insufficient evidence is available to date to ascertain the effectiveness of the GAM model on some physical health indicators (e.g. BMI, glucose levels), findings emerging from these studies suggest that patients may benefit from their participation in a GAM in other ways. For example, in a study to identify the influence of GAMs in the control of T2D in 36 patients attending a GAM in a primary care health centre, Olvera, Ayala, & León (2014) found that patients who participated in the GAMs reduced their caloric intake and increased their knowledge of T2D and physical activity levels. However, it is important to recognize that most of these GAM studies rely on chart-collected data intended for patient follow-up rather than for research purposes. Consequently, this may diminish the trustworthiness of the findings as scientific rigour was not assured.

2.4 Evidence-Based Strategies for Treatment of Obesity Related Diseases

The use of evidence in clinical settings is extremely important as it can help health professionals make informed decisions that will affect their patients’ lives. Evidence-based medicine is the “conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients” (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996; p.71) and can be used by health professionals in conjunction with individual clinical expertise to offer the best possible care
to patients. Because non-communicable diseases are on the rise, researchers have investigated different ways in which these diseases can be treated, managed, and prevented, generating an evidence-base to improve quality of care.

2.4.1 Lifestyle Changes

There is strong evidence that engaging in healthier behaviours, such as eating nutritious foods and being physically active, can reduce risk of and treat chronic diseases (Rippe, Crossley, & Ringer, 1998; Willett et al., 2006). Physical activity has been associated with improved glycemic control, better mental health, and healthy aging (Daskalopoulou et al., 2017; Paluska & Schwenk, 2000; Sigal et al., 2007). A diet full of vegetables and natural foods has been found to reduce the risk of obesity related diseases and contribute to glycemic control (Salas-Salvadó, Martínez-González, Bulló, & Ros, 2011). Lower salt intake is beneficial for controlling blood pressure levels (Sacks et al., 2001), while lower consumption of sugars and carbohydrate dense foods help control glucose levels and reduce risk for T2D (Willett, Manson, & Liu, 2002).

2.4.2 Medication

When lifestyle modifications are not enough to impact disease risk factors, medication is often needed to supplement behavioural efforts. For example, to maintain glucose levels stable, medications such as Metformin, Sulfonylurea, basal insulin, and others are used to attain glucose stability (International Diabetes Federation, 2012). Calcium channel blockers and angiotensin-converting enzyme inhibitors are traditionally used to help lower blood pressure levels (Weber et al., 2014). Adherence to medication recommendations by physicians and medication adherence by patients has been associated with health improvements and reduced disease related costs (Sokol et al., 2005).

2.4.3 Education and Peer Support

There are a variety of interventions that incorporate the above-mentioned strategies for chronic disease management along with patient education and peer support. Educating patients about their
disease and providing them information on how to manage it, has shown promise in improving patient health (Norris, Lau, Smith, Schmid, & Engelgau, 2002; Walton, Snead, Collinsworth, & Schmidt, 2012). Providing this information in a culturally sensitive manner, including culturally relevant lifestyle recommendations that address beliefs about diabetes and obesity, can increase the likelihood that the information provided will be of interest to patients (Ferguson, Swan, & Smaldone, 2015; Latham & Calvillo, 2009). For example, involving community leaders in the creation of education initiatives and using community health workers are ways to culturally tailor the information given to patients (Walton et al., 2012). Providing patients with this information individually or in a group setting have both been found to be effective (Castro-Cornejo, Rico-Herrera, & Padilla-Raygoza, 2014; Lozano & Armale, 1999; Salinas-Martínez et al., 2009), however, an advantage of group education is the possibility of peer support.

As Heisler and colleagues (Heisler et al., 2010) found in their randomized control trial evaluating peer support for glycemic control compared to nurse care, participants who received peer support achieved slightly lower glucose levels than those who received nurse care. Peer support through technology aids (e.g. telephones, text messaging, and reminders) has also been tested and compared to traditional care. However, while the added technology component to peer support was not found to significantly improve health outcomes when compared to peer support, both types of peer support were more effective than traditional care (Anzaldo-Campos et al., 2016). Interventions that incorporated community based peer led sessions and education by health professionals resulted in improvements in communication with physicians, health behaviours, and self-efficacy for diabetes care among participants (Lorig et al., 2009; Tang, Funnell, Sinco, Spencer, & Heisler, 2015).

Research from Mexico indicates that peer sessions can lead to better results than traditional health care (Salinas-Martínez et al., 2009). In a study by Salinas-Martinez and colleagues (2009), patients who attended peer sessions, which comprised of group counselling by a physician and other health professionals (e.g. psychologist, nutritionist, or social worker) along with a medical
consultation, saw more improvements in their blood pressure, cholesterol, and fasting glucose levels than those who did not attend the peer sessions. In a similar manner, the GAMs provide an opportunity to integrate peer support and education sessions in the Mexican context. Social support from friends and family is important for patient health (Berkman, 1995), however, as reported by Cartas-Fuentevilla, Mondragon-Rios, & Alvarez-Gordillo (2011), GAM patients feel most supported by their peers in the GAM (2011), corroborating a previous study showing augmented social support experienced by patients attending a GAM (Montes de Oca, Cardoso, Aguilera, & Castro, 2006). Peer support and peer led interventions are a promising way of educating and motivating patients to manage and improve their health.

2.4.4 Clinical Practice Guidelines

The aim of all health care systems and professionals working therein, is to give quality care to all patients. Using evidence based practice in order to achieve positive health results is one way to provide good quality of care. Clinical Practice Guidelines (CPGs) are recommendations that help implement evidence-based practices and plans of care based on previous research (Turner et al., 2008). The creation of CPGs involves a rigorous process that identifies risk factors and diagnosis for conditions, benefits and harms of different treatment options and patients’ experiences of health care interventions (Woolf, Schünemann, Eccles, Grimshaw, & Shekelle, 2012). Because guidelines are such a useful tool to improve quality of health care, international and national organizations that produce guidelines have emerged to identify and organize CPGs according to medical conditions. Handbooks have been developed to aid these groups in creating CPGs that contain robust evidence that will be most useful for health professionals (Woolf et al., 2012). These handbooks all mention the importance of a “multidisciplinary guideline development group, involvement of consumers, identification of clinical questions or problems, systematic searches for and appraisal of research evidence, a process for drafting recommendations, consultation with others beyond the guideline development and ongoing review and updating of the CPG” (Turner et al., 2008; p. 6). The result of
this arduous process are guidelines that can facilitate evidence-based practice in clinical settings (Lugtenberg, Burgers, & Westert, 2009; Woolf, Grol, Hutchinson, Eccles, & Grimshaw, 1999). However, the facilitation of evidence-based practice does not guarantee an improvement in patient health. The literature on the effectiveness of the CPGs on medical practice is mixed. A systematic review of rigorous evaluations of the impacts of CPGs on medical care concluded that most of the included studies reported better processes of care as recommended by the CPGs, however, a few of these studies did not report significant improvements in the health of patients (Grimshaw & Russell, 1993). A recent study on CPG adherence and health of T2D patients found no relationship between guideline adherence and health improvement (Oude Wesselink et al., 2015). Thus, while CPGs are a tool that can improve the use of evidence in clinical settings, improved health outcomes are not guaranteed.

To date, one study has been published exploring the effectiveness of using CPGs for the treatment of T2D in a family medicine clinic in Mexico (Perez-Cuevas, Reyes-Morales, Flores-Hernandez, & Wacher-Rodarte, 2007). Patients with T2D were randomized into an intervention group or a control group. The intervention group received medical care by a physician trained to use the CPGs while the physician caring for control group participants provided traditional care. By the end of the six-month intervention, patients who received CPG based care saw a greater decrease in their glucose levels and weight than those who did not receive CPG based care (Perez-Cuevas et al., 2007).

2.5 Knowledge Translation

Research findings and new treatments are disseminated to health professionals and policy members through a process called knowledge translation (KT). KT is a collection of methods aimed at closing the gaps between knowledge and practice in medical and health settings. KT is “...a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products, and
strengthen the health care system” (Straus, Tetroe, & Graham, 2009; p. 165). The process consists of the creation, dissemination, and utilization of new knowledge that is usually produced from research. The three main phases of knowledge creation include: knowledge inquiry, knowledge synthesis, and the creation of knowledge tools. These components feed into the research action cycle in which the dissemination and utilization of knowledge takes place (Straus et al., 2009b).

In order for successful KT to happen, whereby new knowledge is disseminated and utilized most efficiently, supporting structures (e.g. training opportunities, organizational capacity, funding) need to be present (Wilson, Brady, Lesesne, & NCCDPHP Work Group on Translation, 2011). Multidisciplinary approaches are also needed to increase KT (Davis et al., 2003; Estabrooks, Thompson, Lovely, & Hofmeyer, 2006). Evaluations of programs and interventions are necessary to assess the effectiveness of different KT approaches and to determine which KT strategies are successful and which need to be improved (Bhattacharyya, Estey, & Zwarenstein, 2011). These steps in the KT process are important as the most successful KT strategies can be selected and used to create new policies and guidelines to improve the quality of care in clinical settings (Estabrooks et al., 2006).

Ways in which knowledge is disseminated include push efforts (producers of knowledge tailor findings and disseminate towards knowledge users) and pull efforts (knowledge users implement strategies to pull knowledge from knowledge sources; Gagnon, 2011). End-of-grant KT (i.e. articles, presentations, and reports) is a form of push effort where researchers report their findings and make them available to knowledge users after the project is finished. By contrast, a pull effort to KT involves the knowledge users creating strategies to “pull knowledge from sources they identify as producing knowledge that is useful to their decision making” (Government of Canada, 2010b). Knowledge exchange efforts aim to bring the researcher and knowledge user together through an iterative process either at the end of or throughout the research project. When knowledge users are involved at the end of a project, they can facilitate end-of-grant KT, however, in an integrated KT approach, knowledge users are involved throughout the project. All of these methods for
dissemination of new knowledge lead to a higher chance of research findings and evidence-based strategies being utilized in real world contexts.

2.5.1 Integrated Knowledge Translation

Integrated knowledge translation (IKT) is an approach of doing research with the central premise that “involving knowledge users as equal partners alongside researchers will lead to research that is more relevant to, and more likely to be useful to, the knowledge users” (Canadian Institutes of Health Research (CIHR), 2012). The IKT process is similar to participatory research because knowledge users are involved in all or multiple steps in the research process, including the creation of the research question, data collection, analysis and interpretation, and dissemination of findings (Canadian Institutes of Health Research (CIHR), 2012). These types of approaches to research can be particularly useful when conducting investigations in foreign settings or where there may be cultural considerations in research.

2.5.2 Barriers and Facilitators to Knowledge Translation

KT tools, such as CPGs, are often created and used to facilitate the utilization of evidence-based practices by health professionals (Straus et al., 2009b). However, when implemented in a real-world context, physicians are often faced with barriers that can prevent them from applying the CPGs as intended (Larme & Pugh, 2001). Studies have identified attitudes towards guidelines, self-efficacy, lack of support staff, and more as barriers to CPG application (Cabana et al., 1999; Larme & Pugh, 2001; Martin et al., 2005). In addition, there can be high financial demands to bridging the gap between knowledge creation, dissemination, application, and evaluation (Santesso & Tugwell, 2006). This can create significant challenges for LMICs where resources and funds are often limited.

Because KT can lead to evidence-informed decision-making in health care settings, tools and strategies have been developed to facilitate the process. For example, knowledge brokers are individuals who facilitate the transfer of new evidence to knowledge users and are usually situated
between the world of researchers and decision makers (Ward, House, & Hamer, 2009). Apart from knowledge brokers, push efforts, facilitated user pull (affordable sources of evidence for knowledge users), and partnerships are also ways to facilitate KT (Lavis, 2006). However, when investigating ways to support evidence-informed decision-making in health systems, Ellen and colleagues found that participants at different levels of the health system (senior managers, library or resource centre managers, and knowledge brokers) identified an interest from their respective leaders to invest in resources and create a KT culture as the most critical facilitator of KT (2014). This reflects the importance of cultivating the right organizational climate to support research use as reported in the research knowledge infrastructure framework (Ellen, Lavis, Ouimet, Grimshaw, & Bédard, 2011).

2.6 Critique of the Literature

While there are several studies highlighting the benefits of lifestyle changes, medication adherence, peer support, and use of evidence-based practice, most of the research has been conducted in developed countries (Heisler et al., 2010; Lorig et al., 2009; Lugtenberg et al., 2009; Tang et al., 2015). Although the development of recommendations included in CPGs is typically founded on a rigorous protocol that ensures the quality and validity of research evidence (Woolf et al., 2012), studies producing this research evidence have been conducted mainly in contexts unlike those found in LMICs. This raises the question of relevance of ‘first-world’ CPGs for LMICs. In fact, one of the main barriers to CPG application reported in the study conducted by Perez-Cuevas et al. was the lack of perceived applicability of the CPGs for a LMIC context (2007). For example, it may be that some CPGs are perceived as unachievable due to local constraints related to geography or culture.

The literature on KT is also largely based on the context of the developed world, and while KT strategies and frameworks can be applied to LMICs, the resources needed to carry out KT processes are not as abundant in LMICs (e.g. health personnel and funding; Santesso & Tugwell, 2006). There are also contextual and cultural factors that need to be taken into account when attempting a KT
intervention such as the implementation of CPGs in LMICs. Although addressing the gap between knowledge availability and knowledge use in LMICs is on the agendas of international research institutions, such as the WHO, there have been a limited amount of KT interventions in the developing world (Government of Canada, 2011; Siddiqi, Newell, & Robinson, 2005). In fact, the health disparities between developed countries and LMICs provide further motivation for KT initiatives in LMICs as the best evidence is not always utilized to address many health problems (Gwatkin, 2003; Neufeld et al., 2001). More, high quality studies in LMICs are required to strengthen KT strategies and evidence-based practice in these contexts.

2.7 Research Purpose/Rationale

To date, the few studies conducted on the GAMs report mixed results (Lara Esqueda et al., 2004; Muñoz-Reyna et al., 2007). However, the GAMs have been shown to be a rich context for peer support and education, which can help improve patient health (Cartas-Fuentevilla et al., 2011; Montes de Oca et al., 2006; Olvera et al., 2014). The use of evidence-based practice by physicians can enhance quality of care (Lugtenberg et al., 2009; Perez-Cuevas et al., 2007; Woolf et al., 1999), yet physicians often face barriers to implementation of evidence-based recommendations in real-world settings (Cabana et al., 1999; Larme & Pugh, 2001). To our knowledge, no study has explored barriers to CPG application in the GAMs. Thus, the overarching purpose of this study is to investigate the barriers and facilitators to CPG application from the perspective of physicians working in the GAMs. An objective of this thesis is to reflect the perspectives of physicians working in GAMs as they can give a first-hand account on the application of CPGs in the GAMs and what could be done to improve the use of evidence in their clinical settings. Identifying the barriers and facilitators to successful CPG application by physicians is an important step in the KT process as it can help address barriers and enhance facilitators to CPG application, increasing quality of care provided to patients (Légaré & Zhang, 2013).
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Chapter 3

Manuscript

Exploring Barriers and Facilitators to Clinical Practice Guideline Application in Mexican Mutual Aid Groups

Keywords: Chronic disease management, diabetes, peer-support, physicians, Mexico.
Abstract

**Introduction:** Lifestyle-induced chronic diseases have increased rapidly across the globe over the last few decades. Diseases related to obesity such as Type 2 Diabetes, cardiovascular disease, and hypertension are becoming leading causes of death worldwide. The effect of these diseases is becoming increasingly apparent in low and middle-income countries such as Mexico. In response to the rising rate of deaths due to chronic diseases, the Mexican government enacted a policy called the *Grupos de Ayuda Mutua* (GAM). A GAM is a peer-support group of patients with lifestyle-induced chronic diseases that receive guidance and oversight by a multidisciplinary group of health professionals. The health professionals are guided by evidence-based clinical practice guidelines (CPGs) to provide the best quality of care to their patients, however, when CPGs are applied in real world contexts, unforeseen challenges to adherence and application are observed (Larme & Pugh, 2001). Barriers and facilitators to physician implementation of CPGs within the context of Mexican GAMs are currently unknown. **Purpose:** The purpose of this study was to explore barriers and facilitators to CPG application from the perspective of physicians in Mexican GAMs. **Methods:** With the collaboration of the Secretariat of Health in Jalisco, physicians (n= 24) were recruited to participate in semi-structured interviews guided by the Clinical Practice Guideline Framework for Improvement (Cabana et al., 1999). Deductive thematic analysis was conducted to identify the barriers to CPG application in Mexican GAMs. Inductive analysis was used to identify facilitators to CPG application and recommendations from participants regarding how the GAMs and application of CPGs could be improved. **Results:** Physicians reported a variety of barriers and facilitators to CPG application in the GAMs. Barriers included lack of medication availability, lack of regional guidance, institutional culture, and more. Facilitators included creativity, seeing results, choosing the “right” patients, and more. **Discussion:** This study is the first to explore barriers and facilitators to CPG application in GAMs. Study findings can be used by state health officials to improve the GAM strategy and facilitate the use of evidence-based methods.
3.1 Introduction

Obesity around the world has increased dramatically (WHO, 2016). Shifts in eating habits and physical activity levels have caused an epidemiological transition in which common causes of death in most countries are now lifestyle based, rather than attributable to infectious diseases (McKeown, 2009). Obesity related diseases such as Type 2 Diabetes (T2D), hypertension, cardiovascular disease (CVD), and metabolic syndrome have become leading causes of death worldwide (WHO, 2017a). In low-and-middle-income-countries (LMICs), the impact of these non-communicable diseases (NCDs) is coupled with that of infectious diseases and hunger, exposing LMIC populations to a “double burden” of disease (Caballero, 2005).

In Mexico, NCDs such as T2D and CVD are among the most common causes of death (INSP, 2012). In 2013, health care spending for obesity-related diseases alone cost the Mexican health care system US$880 million (Barquera, Campos, & Rivera, 2013). Results from a survey conducted by the Mexican National Institute of Public Health (INSP) report that 72.5% of Mexican adults have overweight or have obesity (INSP, 2016). Despite strong evidence showing that healthy nutrition can reduce the risk of developing obesity and obesity-related diseases, the majority of Mexican adults do not engage in these healthy behaviours (Rivera, Barquera, González-Cossío, Olaiz, & Sepúlveda, 2004; Stern, Piernas, Barquera, Rivera, & Popkin, 2014). The consumption of sugar sweetened beverages significantly increased between 1999-2012 and became a major contributor of daily energy intake for Mexican adults (Stern et al., 2014). Although a national survey in 2012 reported that over 80% of Mexican adults engaged in the recommended levels of physical activity (INSP, 2012), it is well documented that self-reported physical activity measures greatly overestimate physical activity (Prince et al., 2008).

In response to the alarming rise of NCDs in Mexico, the national government has implemented a variety of policies and strategies through its health care system (Barquera et al., 2013). One of them is the Grupos de Ayuda Mutua (GAM; Mutual Aid Groups) in which a multidisciplinary team of
health professionals work with a group of patients with lifestyle based chronic diseases (e.g. T2D, hypertension) to address their health issue (Programa de Salud en el Adulto y en el Anciano & CENAPRECE, 2017). The patients receive medical care and education about their health condition from the team of health professionals and social support from their peers. Interventions with similar components (i.e. peer support, education) have shown promise in the treatment and management of chronic diseases such as T2D and hypertension (Lorig et al., 2009; Tang et al., 2015).

The use of evidence in clinical settings is extremely important as it can help health professionals make informed decisions that will affect their patients’ lives (Woolf et al., 1999). Clinical practice guidelines (CPGs) are evidence-based recommendations designed to offer strategies and treatment options to physicians so that they might provide the best quality of medical care possible to their patients (Woolf et al., 1999; Lugtenberg, Burgers, & Westert, 2009). While CPGs can improve quality of care, some studies have found little to no relationship between CPG application and patient health outcomes (Oude Wesselink et al., 2015; Worrall et al., 1997). However, in one study conducted in a family medicine clinic in Mexico, patients who received CPG based care for the treatment of T2D saw a greater decrease in their glucose levels and weight than those who did not receive CPG based care (Perez-Cuevas et al., 2007).

A variety of barriers can prevent the application of CPGs by physicians and health professionals (Larme & Pugh, 2001). Specifically, studies have identified attitudes towards guidelines, knowledge, self-efficacy, lack of resources, and more as barriers to CPG application (Cabana et al., 1999; Larme & Pugh, 2001; Martin, Williams, Haskard, & DiMatteo, 2005). In addition, there can be high financial demands to bridging the gap between knowledge creation, dissemination, application, and evaluation (Santesso & Tugwell, 2006). This can create significant challenges for LMICs where resources and funds are often limited.

In Mexico, physicians treating patients with NCDs are expected to adhere to the CPGs for the treatment and prevention of NCDs developed by a group of national health experts from the National
Centre for Health Technology Excellence and Health (CENETEC). Identifying and addressing barriers to CPG application can increase the likelihood that evidence-based practices will be used in clinical settings, improving quality of care provided to patients. To our knowledge, no study has explored barriers and facilitators to CPG application in the GAMs. Thus, the overarching purpose of this study is to investigate the barriers and facilitators to CPG application from the perspective of physicians working in the GAMs.

3.2 Methods

This study was cleared by the General Research Ethics board at Queen’s University (Appendix A).

3.2.1 Methodology

A case study methodology was used to conduct this research to allow for an in-depth exploration of the GAMs and the barriers and facilitators to CPG application within the GAM strategy. Case studies are useful when the relationship between context and a phenomenon are unclear (Yin, 2003). Cases can be a phenomenon, a group of people, event, organization, community, or an individual person. Because the “cases” are linked to multiple facets of society (e.g. political, social, personal) it is important to look at the chosen case from various angles to understand the bigger picture (Baxter & Jack, 2008). The magnitude of the GAM strategy and the numerous variations within, make a case study methodology appropriate for this research.

3.2.2 Guiding Framework

To identify barriers and facilitators to CPG application, this study was guided by the Clinical Practice Guideline Framework for Improvement (CPGFI). Developed by Cabana et al. (1999), the CPGFI was created to help health researchers design effective interventions to change physician behaviours. By conducting a systematic review of the available literature, Cabana et al. identified three main barriers that affect CPG application: knowledge, attitudes, and behaviour (Figure 1). They found
that lack of awareness about the guidelines and lack of familiarity about what the guidelines recommend were the two main barriers to knowledge about CPGs. Barriers related to physicians’ attitudes towards applying CPGs in their practice include lack of agreement with guidelines, lack of outcome expectancy, lack of self-efficacy, and lack of motivation. Behavioural barriers (i.e. patient factors, guideline factors, and environmental factors) were found to influence behaviour as well as attitudes and knowledge. This framework originally observed barriers to following the guidelines for pediatric asthma, however, it has also been used to determine factors that could influence other types of health outcomes in medical settings (Légaré & Zhang, 2013; Lugtenberg et al., 2009; Salinas et al., 2011; Taba et al., 2012). Given that this framework was created and has been used to identify barriers to CPG application (Cabana & Kim, 2003; Cabana, Rushton, & Rush, 2002; Lugtenberg et al., 2009; Salinas et al., 2011; Taba et al., 2012) and that it is endorsed by the Canadian Institutes for Health Research (CIHR) as one of its key conceptual models for assessing barriers and facilitators to knowledge use (Government of Canada, 2010a), it is an appropriate guiding framework for this research.

**Figure 1: Clinical Practice Guideline Framework for Improvement**

(Cabana et al., 1999)
3.2.3 Interview Guide

For the purposes of this study, a semi-structured interview guide was developed based on the CPGFI (Appendix B), it was translated to Spanish, checked and edited by SSJ officials for cultural appropriateness, and piloted to fine tune questions. Interviews were semi-structured to allow interviewees to answer questions from the interview guide and for flow (Baumgartner, Strong, & Hensley, 2005). Field notes were also taken throughout the data collection and presentation of findings in Mexico to record thoughts and ideas on research processes, as well as to capture interactions with participants and observations of the Mexican clinical setting (Ritchie, Lewis, Nicholls, & Ormston, 2013).

3.2.4 Recruitment of Participants

Purposeful criterion sampling was used because this approach allows the researcher to gather information-rich cases that meet a set of criteria in order to fully explore a phenomenon (Palinkas et al., 2015). Since the case in this study is exploring CPG application in the GAMs and physicians typically oversee medical procedures and consultations, physicians were considered to be the GAM health professional best equipped to apply CPGs. Of GAM affiliated physicians, only physicians who were also the coordinator of a GAM were eligible to participate as they were considered to be most knowledgeable about the GAM strategy and to have constant contact with GAM patients.

Recruitment of participants was carried out in partnership with the SSJ through state officials’ connections within the GAM strategy. Research partners included the state coordinator of the GAM strategy, state physical activity coordinator, and the director of the preventive medicine department at the SSJ. SSJ officials came up with a list of 25 potential participants, representing eight of the 13 Jalisco health regions, that met the inclusion criteria and that would be available during the four-week data collection period from November to December 2016. A geographically convenient sampling strategy was employed to facilitate transportation to most health centres. GAM accreditation level was also considered and, at the time of data collection, 14 GAMs had achieved a level of accreditation and
11 were not accredited. Figure 2 is a map of most of the health centres that were visited. A brief presentation was made to inform regional coordinators of the project and to request their help in recruitment. Physicians were then contacted by their regional coordinators to check their availability to be interviewed.

**Figure 2: Map of Visited Health Centres**

![Map of Visited Health Centres](image)

### 3.2.5 Participant Characteristics

Of the 25 potential participants, 24 (15 women, 9 men) participated in the study; the remaining physician could not be reached. Physicians had been working with their GAM for an average of four years (range= five months-16 years). All of the physicians worked in a primary care setting but may have had further specialization.
3.2.6 Data Collection

I visited most of the health centres and conducted interviews in person at the health centre; one interview was conducted at a restaurant of the participants’ choosing. There are multiple advantages to in-person interviews such as ability to clear up misconceptions, elaboration of response, opportunity for the researcher to follow up on responses, and increased possibility for the participant to provide accurate responses (Baumgartner, et al., 2005). However, not all interviews could be in-person as some of the health centres were too far away, thus, two interviews were conducted over the phone. The interviews started when the participant gave consent to participate (Appendix C) and had the chance to ask any questions they might have. All interviews were conducted in Spanish. Introductory questions about the GAM strategy as a whole and the participant’s GAM were asked followed by questions about the CPGs guided by the CPGF. Participants were also given the opportunity to comment on how to improve the application of the CPGs and how to enhance the GAM strategy. I asked follow up questions when appropriate, such as whenever a participant raised a new topic.

A total of 24 interviews were conducted, most of them lasting approximately 30 minutes, with the shortest one lasting 15 minutes and the longest lasting one hour and 45 minutes. All interviews were audio recorded to accurately document participant responses. No notes were taken during the interviews to ensure that a conversational atmosphere was preserved and that interviewees would not feel that they were being judged or evaluated by an SSJ affiliate (i.e. me). All interviews were transcribed verbatim in Spanish, yielding a total of 180 pages of transcripts, which were double-checked for accuracy. I also kept field notes which included observations about the setting of the interview, interactions with participants, things the participant may have mentioned prior to recording or after the recording had stopped, informal conversations with SSJ officials, and research reflections. I also typed or hand wrote field notes in English for a total of 41 pages.
3.3 Data Analysis

Following Braun and Clarke’s (2006) six steps for thematic analysis, textual data were deductively and then inductively analyzed. Starting by transcribing the interviews and becoming familiar with the data, I systematically organized codes that emerged from the data into the CPGFI. This process was facilitated by referring to field notes and contextual knowledge which helped me identify which codes belonged to each construct of the CPGFI. Inductive analysis was used to search for additional themes as there is no previous research on barriers and facilitators to CPG application in GAMs. Codes and ideas that did not fit into the CPGFI were considered separately to see how they added to the understanding of CPG application in the GAMs. Researcher field notes and observations were used during this process to strengthen interpretation and understanding (Halcomb & Davidson, 2006).

Initially, GAM accreditation level (accredited vs. non-accredited) was considered during analysis to identify any differences in the barriers and facilitators faced by physicians. However, as the analysis was carried out, the barriers mentioned by physicians were very similar, regardless of GAM accreditation.

To reduce bias and enhance rigour to the study, critical friends were included. Critical friends are trusted colleagues that can provide support and critical perspectives on the processes and analysis of the research (Foulger, 2010). A total of four critical friends (two from Canada, two from Mexico), chosen by me, participated in the analysis. One critical friend from each country had knowledge about the research project and had expertise that allowed them to challenge me on my analysis decisions. The other critical friends had research expertise (but were not familiar with my research project) that allowed them to question methodology and ask questions to clarify ideas. To prepare for critical friend meetings, a systematic script that summarized the rationale for the study, the methods used, initial analysis and findings was created; in this manner, all critical friends had the same information. This script was in Spanish and English and conversations were carried out in the primary language of the
critical friend. After each conversation with a critical friend, I wrote down reflections of clarified and/or new ideas that came out of those conversations.

Critical friends’ contributions to the analysis were substantial as they provided additional perspectives which allowed for a more holistic understanding of the phenomenon. For example, one critical friend from Mexico further described what patients might be experiencing in their health centres and how that might be impacting physicians’ behaviour. By bringing attention to the issue that many of the patients in Seguro Popular are of low-income backgrounds and have few years of education, she provided emphasis to a topic that had only been mentioned by a few physicians. This knowledge of the patients’ background was important to consider during analysis as it added a layer of understanding to the physicians’ comments. Using critical friends during the analysis was helpful as their perspectives (whether they were familiar with the research or not) provided four different lenses through which the data could be further interpreted.

### 3.4 Trustworthiness and Dependability

I followed several steps to ensure trustworthiness and validity of the study findings and methods. As mentioned previously, critical friends were included in the analysis process. This allowed the analysis to be revised from different perspectives, enhancing the dependability of the findings. I also kept a reflexive journal throughout the study in which I noted my observations, conversations, decisions, and reflections, which allowed for conscious consideration of context during the analysis. For example, while I was analyzing the transcripts, I would often refer to my journal and field notes to remember any key ideas or specific considerations during the data collection period. I also delivered a presentation of findings to SSJ officials and GAM physicians to get their perspective. This gave them, the experts on the GAM strategy, an opportunity to question the findings if they disagreed with anything that was presented and to add to the analysis if some concepts were overlooked.
3.5 Results

Physicians who participated in this study mentioned a variety of barriers and facilitators to the application of CPGs in their GAMs. Barriers are considered factors that limit or restrict the application of CPGs. Facilitators are considered factors that promote or help application of CPGs. Verbatim quotes from participating physicians are presented below. I translated these quotes from Spanish to English for the purpose of reporting them in this thesis. Quotes are identified by sex (M=Man, W=Woman) and participant code for each interviewee. For example, W321 refers to a participant, who is a woman and M315 refers to another participant, who is a man. Words in brackets, [ ], are not verbatim, but rather author additions to clarify the meaning of verbatim.

3.5.1 Barriers to CPG Application

Barriers Related to Knowledge

Most physicians mentioned that they were aware of and familiar with the CPGs for diabetes, hypertension, and metabolic syndrome (chronic diseases treated in the GAMs). Only two physicians mentioned not having access to a printed or digital copy of the guidelines. While most physicians mentioned being familiar with the CPGs, one of the younger physicians commented that the senior physicians sometimes were uncomfortable when they had presentations on the CPGs for a certain health condition. This physician said:

“the youngest [physicians] are interested in learning because they need to take the national exam. But when the health professionals that have been working for 20-30 years, maybe they haven't reviewed the CPGs. The times when they listened to the [guidelines] they would seem uncomfortable...” (M457)

This can indicate a lack of awareness or familiarity with the CPGs by physicians who have been working in the health field for decades.
Barriers Related to Attitude

Physician discomfort with guideline recommendations

When asked about the guidelines, most physicians mentioned that the CPGs were very helpful and that they were a good way to apply proven strategies into their practice. However, a few physicians also mentioned that the majority of the research conducted to inform the CPGs, are often from developed First-World countries that do not have a Mexican context where many live in poverty and cannot afford or don not have the capability of accessing the things recommended in the guidelines. As one physician put it, "what's the diet of a diabetic patient? I mean, they don't have money to buy other than beans and tortillas! How are we going to do this? I think it would be good to revise some things where the author is from Mexico" (M493).

Lack of self-efficacy

When physicians were asked about their perceived ability to apply the CPGs in their context, all physicians mentioned that they believed they could apply them and that they do apply them regularly. However, one physician mentioned that he was a specialist in bariatric medicine and had been tasked to help other GAM physicians in providing care for their patients. This particular physician mentioned “that fellow physicians sometimes don't know how to start an insulin treatment. So, this generates a bit of fear to start it and this leads to an inadequate treatment for the patients” (M315). It seems that some physicians may feel uncomfortable with a medical procedure or not know how to carry it out, which might deter them from properly applying the CPGs.

Lack of motivation

While no physicians commented on lack of motivation to apply the CPGs in their GAM, some mentioned that working in the GAMs is very difficult at times and that they get demotivated from time to time. One physician said, “it had been a year and a half or so, I was about to leave the group
because I noticed we were stuck. [Patients] no longer listened to me” (M235). This physician commented on how interactions with patients can be discouraging, which can then impact a physician’s motivation to apply the CPGs with GAM patients.

**Behavioural Barriers**

**Patient factors**

A few physicians mentioned that their patients do not listen to the recommendations that they give and continue engaging in unhealthy behaviours. For example, one physician reported that, “a problem here is that people [i.e., patients] lie a lot. This is a big problem. They come here and tell me ‘no, I don’t drink coke’ and then I find them on the street drinking coke” (W953). This physician went on to say that she tries to motivate her patients to engage in healthier behaviours but that patients rarely respond:

“we don’t know what to do anymore. I don’t think we are the problem...we have given it our all...I don’t think we, as a health unit, are the problem, but rather the [patients]...And it’s not about reaching the goal of the GAM, but to improve their health, but they don’t want to. They laugh. They get here weighing 120 kilos and I tell them ‘you gained two kilos, your [health condition] is not in control’ and they laugh ‘oh doctor, it’s just that I can’t help eating bread’.” (W953)

Some patients, as reported by M493, are motivated to change their behaviour and to follow recommendations, but may be unable to do so because they lack the financial resources:

“[the patient] goes and diets and exercises because it’s what’s least expensive. But to apply insulin you need to use a syringe...and what if they don’t have it?...I see patients and I give them their prescription and the following month I see their [blood] results and I say ‘well, we didn’t make any progress. How are we doing with the insulin?’...[and the patient says] ‘I didn’t have [money] to buy a syringe’.”
**Environmental factors**

**Lack of time**

Many physicians mentioned that they have so many other responsibilities outside of working in the GAMs. As one physician put it, "...you work with the group but you also have the consultation, vaccinations, promotion, visits, I mean, and you then have to dedicate more time [to the GAM]" (M493). Within this context, some physicians also mentioned that they are only allowed to see patients for a short time as the demand for medical attention is so high, which does not leave enough time to address all GAM patient needs. M315 conveyed that "traditionally the average consultation in the health centre is supposed to be around 20 minutes".

**Lack of resources**

The majority of physicians mentioned that a lack of medication is a major barrier to CPG application. As one physician put it, “we can work with a guideline that uses certain types of medications- it tells you about different activities...but if there are no medications, it’s damaging” (M562). Most physicians mentioned that at some point during their time with the GAMs, they have experienced a lack of medication. One physician mentioned that the lack of medication was not only obstructing their ability to care for their patients, but was also impairing their patients’ motivation to attend the GAM. “You can form a group and have...a lot of enthusiasm, but suddenly you come to a 3-4-month lapse without medication, the group stops coming” (M315).

Physicians talked about how medication used to be accessible through health centre pharmacies, but that many of these pharmacies have been closed: “A year and a half ago, the pharmacy disappeared, so people now can’t go [get medication], sometimes because of money that they would have to spend to go to the next community to get their medication” (M457). One physician openly said that the lack of medication and resources might be caused by a lack of initiative from the current political administration. As he put it, “we have had a huge shortage of medications. Ever since this [political] administration got into power. With previous administrations, this did not happen” (M235).
While this participant was the only one who openly mentioned this during the interview, there were a few other physicians who also alluded to an unsupportive political climate.

While a shortage of medication seemed to be the barrier that was consistently mentioned throughout the interviews, some physicians mentioned that there was also a lack of general resources in the health centres. Apart from medications, there are other medical resources that are in low supply in some GAMs, such as glucometers, which can get in the way of treatment.

“There was a month where we didn't have a glucometer. So, I didn't know if they were controlled or not because I didn't know what their fasting glucose was, so it made my work much more difficult because I didn't know if I needed to make [treatment] modifications. If I should leave them as they are, if they had low sugar and I should take away medication, if they had high sugar and I had to increase medication.” (W129)

Not only are material resources in short supply but physicians also reported that there is a shortage of personnel support. As one physician put it, "money destined for health, it is much lower than hoped for. So, we're low on material, not only in infrastructure or in services, but also in personnel" (W298). The lack of medical personnel is something that was mentioned by many physicians as they need support to keep up with the high number of patients. The case of one physician was particularly interesting as, in addition to only having a health promoter as support staff, there were times when basic materials, such as paper, were lacking. As the health promoter who was present during the interview said: "There are occasions in which we don't even have paper for [patient] information...we have to make copies. And for that, [the physician] invested for the folders and paper, not the Secretariat of Health. The doctor bought them" (W461). It is to these extremes that some health centres see the shortage of resources.

Finally, some physicians mentioned that there is a lack of space in many health centres for there to be GAM meetings.
"There’s very little...The people have to put a lot of themselves to push programs like this forward. We have a space, but this space where we get together, they built it. I mean, the people of this town. People that have family in the United States had them send money and we made a room. This room is where we gather and where we have our meetings."

(M457)

Organizational constraints

Another barrier to CPG application that emerged from the physician interviews was the stagnant institutional culture of the Secretariat of Health. One participant said that before he took over as coordinator of his GAM, the previous GAM was not properly following the protocol that GAMs should follow. As he put it, "there used to be [a GAM] but it was appearances, really. They signed [the attendance sheet] and left. This is what happens often here" (M235). This physician went on to say the following about physicians and the GAM: "The doctors here, they don't like this [the GAM]. No, it's a reality. Not all doctors, I think it's a very small percentage, the doctors that like this [the GAM]." (M235).

Physicians in GAMs are supposed to receive support from a multidisciplinary team of health professionals. Only seven of the 24 GAM physicians interviewed had access to a full multidisciplinary team composed of a physician, psychologist, nutritionist, physical activity specialist, and nurse. A barrier that physicians mentioned was the lack of consistency in the multidisciplinary team, typically due to the constant rotation of health professionals who complete their placements in the required six months and then leave due to a lack of job prospects or because they get placed in a new location. As one physician put it, "for example, I have a nurse that really takes to the plan...who does everything right and, at six months, they give me a new one" (W298). Other physicians mentioned how some of the multidisciplinary team members are not consistently showing up at their assigned time with the GAM. "The physical activity specialist that comes from the region, he has failed us a lot. Because he’s supposed to come...because he’s part of the [multidisciplinary] team, but he misses a lot" (W713). One
physician also revealed that sometimes the multidisciplinary team health professionals don't do a good job. As he put it, "we didn't count on the psychologist very much. On the contrary, I had to ask that they no longer send him because my patients had very bad experiences" (M235). These comments highlight the inconsistency and sometimes lack of quality in the multidisciplinary health staff available to the GAMs.

Each of the 13 health regions of Jalisco has a regional coordination team with a regional coordinator that has direct contact with state officials at the SSJ. These regional coordinators have the responsibility to distribute resources, including the multidisciplinary team, to the health centres according to their needs. Physicians reported that sometimes the regional coordinators are not as involved and that they may not receive the necessary support from the region to make their GAM work. As one physician put it, "before they supported me with lab work, with people that came to give us information, the nutritionist supported us, even the psychologist. Yes. We had them. But now they haven't sent us the personnel that have this type of training" (W822). This lack of involvement extends beyond sending materials and personnel support. As one physician related, sometimes those working in the GAMs are left with no guidance on how to properly treat their patients.

"There's a lack of knowledge. I mean, they say that you have to form a group of 20 people and that you should get them to adequate control, but in reality, they don't tell you the appropriate way in which to do this. That you should not forcefully cling to, say a guideline, but that you should find a way to adapt that guideline...to the context of your patients." (M315)

Because physicians at the primary level have limited resources, personnel, and time, physicians often have to refer their patients to a hospital or specialist to receive special treatment or to get a test done. However, the wait time to be seen by a specialist or to get into a hospital is often two months or more. As one physician stated, "if I send them to the hospital, they don't get seen immediately, they
take time. Same thing with the specialists. If I need support from a specialist...sometimes appointments take close to two months” (W298).

### 3.5.2 Facilitators to CPG Application

#### Physician Specific Facilitators

Most of the physicians who were interviewed mentioned that they had access to the guidelines and that the CPGs were a helpful tool that they used frequently. Physicians mentioned that accessibility to the guidelines was particularly useful, whether by paper or electronic copy. One physician who had a computer in her office said, "it's to say 'look, I have them here, I'm stuck, now I look them up.' It's not necessary to know them by heart, instead knowing that they're there and that you can consult them” (M457).

While not all physicians mentioned having education beyond their medical degree, a few physicians commented on how their further training helped them perform well in their GAM. One physician said, "what I feel helped me a lot is that I did a Master’s. I did a Master’s in Family Sciences so, whether you want to or not, all that you know, all that you prepared, you can apply it” (W321). The applicability of a Master’s was also echoed by another physician, who said: "Maybe because of my studies, I have a Master’s in Public Health, so you know these Master’s are about being in the community. About going and investigating the diseases, seeing in what way we can help, how we can do it, together” (M235). Because they had pursued a Master’s degree, these physicians felt that they were more prepared to apply their medical knowledge in their practice with the shared input from their patients.

Physicians also mentioned that they were motivated to apply the CPGs in their practice because they are required to do so by the Secretariat of Health. As one physician related, “it is demanded of me to use the CPGs so I have to do it. I have to do it because in my notes I have to write ‘treatment based on the CPGs'” (W263). However, others also mentioned that the reassurance of using recommendations developed by experts was also a motivator, "it is the certainty that I'm going to do
something that is correct because, if one checks the references, you notice that they're made by
experts. They're not people that randomly made [the CPGs]" (W379). Another physician also
mentioned that the guidelines made her job easier, "well, firstly it facilitates the job. Really makes it
easier. The structure...the patient learns how they should be [taking care of themselves]" (W321).
Finally, physicians also talked about how seeing results in their patients was a key motivator for
applying the CPGs. As one physician comments, "it's the results... Having a CPG, you see that these
are topics that have been reviewed, that have been studied and that you have them helps you know that
what you apply will give you a positive result" (M493).

In addition to the several barriers to CPG application identified, physicians also discussed
facilitators to CPG application. Facilitators were reported at two levels, at the SSJ level and at the
GAM level.

Facilitators Provided by the Secretariat of Health

When good regional leadership is present, physicians have more resources to do their job, as
described by W129:

"Our municipal doctor. In terms of medicine, he always sends us more because they have
a smaller population. He always sends us more. Glucometers, he's also on top of that. In
fact, those who come to supervise the GAM, until recently, brought us a glucometer and
they took the old one."

W910 also mentioned receiving support from the SSJ:

"Now with the coordinator, I see that, well with my years working here with the
Secretariat, I see a positive change. Very favorable. There's interest from part of the
coordinator. I mean, there's an interest for the program. She looks for alternatives, no?
To give us glucose strips, to give us the materials so that we can give patients diagnostic
tests."
Physicians also reported that having good support from the multidisciplinary team is very helpful to them in providing patients with the proper information. As this physician stated, "right now, we have a psychologist and nutritionist. Honestly, it's a very good support because, yes, we have medical knowledge but I am not the right person to talk to them about emotional problems and such" (W298).

**GAM Specific Facilitators**

A primary motivation for physicians in GAMs is seeing their patients' consistent participation and dedication during their GAM meetings. One physician commented on a time when he was ready to quit his GAM, but he heard his patients talking about what the GAM meant to them, as described below:

"I hear a patient that says, 'today is my day.' He says, 'my job' because he works at home, 'I tell my suppliers and customers that on this day, they shouldn't come before noon. After noon, I'll be here. Not before because these are my sacred days' [speaking about the GAM]...Then another patient says 'I tell my children 'I don't know if there's enough to eat today. If not, go eat over there because today I am going [to the GAM]'. And 3-4 patients make these kinds of comments and...my thoughts were erased and I said 'well, now I have to find a new way to motivate them.'" (M235)

The right type of patient can be a motivator for physicians to maintain their efforts in the GAMs. One physician mentioned that when he started his GAM, "[he] started choosing patients that were in critical health conditions" (M493). This was, he explained, because these were the patients that would benefit from the GAMs the most, so he recruited them. Another physician echoed this idea of choosing the right patient; he explained that "patients should be conscious of their condition. Patients that are following their treatment. Patients that are not going to leave you half way" (M315). These comments reflect how choosing patients that are dedicated and that would greatly benefit from being a part of the GAM can facilitate physician motivation.
Finally, another facilitator for CPG application stems from the concerted efforts of the patients' engagement and physicians' commitment. As mentioned earlier, there is a shortage of medication in Mexico, which has forced patients and physicians to come up with creative ways of obtaining medication. One physician tells his patients to "look for all the strategies of getting the money. With a brother, with the cousin..." (M131). Because if none of the Seguro Popular health centres or clinics have medication, patients have to search and pay for their medication. Another physician mentions that the patients often share their medication when there is a shortage. "With them there are strategies. For example, there's no insulin. Okay. 'Who has insulin? Good. Give her some and when I get more I'll give it to you.' They share the medication..." (W321). These are ways in which physicians and patients work together to come up with strategies to get the proper medication.

When faced with a lack of support from the Secretariat of Health, one physician goes beyond her duties to make sure that she is as prepared as possible to properly treat her patients. When commenting on the lack of support from a multidisciplinary team, W461 mentioned:

"I am one of those people that is in agreement that chronic patients should be given a multidisciplinary team. Unfortunately, we don't count with that support so, what do we do? We look for trainings, to be up to date and be able to assess [patients]."

"I have a certification as a diabetes educator. And, well, there I learned about nutrition. I learned exercises. I learned many things...to try to make up for the lack of multidisciplinary team."

These comments display how finding ways to further her education helped this physician to deal with the lack of support from a multidisciplinary team. These trainings and her dedication to her GAM also led her to develop "games" that she uses to educate her patients. As she puts it, "I said to myself, 'maybe if I bring a projector, I'll teach them and they will learn.' It's not true...we noticed that [they don't] necessarily learn from watching something. No. They learn by playing" (W461). This physician came up with interactive lessons to teach patients about diabetes, medication, healthy living, and more.
Incorporating what she has learned from her training, she is able to translate those practices into her treatments and teach her patients about how to properly take care of themselves.

3.6 Discussion

This study explored the barriers and facilitators to CPG application in GAMs from the perspective of physicians. The CPGFI was used to guide this research because it has been used in previous studies exploring barriers and facilitators to CPG application (Lugtenberg, Zegers-van Schaick, Westert, & Burgers, 2009; Salinas et al., 2011; Taba et al., 2012). Physicians mentioned barriers related to knowledge, attitude, and behaviour, however, most of the barriers could be situated within the behavioural construct of the CPGFI (e.g. lack of resources, lack of time, organizational constraints). This is consistent with findings from the literature which cite similar barriers to CPG (Larme & Pugh, 2001; Lugtenberg et al., 2009; Salinas et al., 2011). Some of the constructs in the CPGFI were not mentioned by participants (e.g. lack of outcome expectancy) as all participants mentioned having seen their patients improve their health when CPGs were applied. Guideline factors, such as contradictory guidelines, were also not brought up by physicians during the interviews. That these constructs were not recognized as barriers by the Mexican physicians demonstrates a difference between the current findings and previously documented evidence (Lugtenberg et al., 2009). This discrepancy could be due to the tremendous impact that the lack of resources has on the physician’s ability to apply the CPGs. Because the dearth of resources is such a prominent barrier, when resources are available and physicians are able to fully apply the guidelines, they are more likely to recognize the improvement in their patients’ health.

Lack of medication, resources, and time were most commonly mentioned as major barriers to CPG application. When physicians are low on medical resources and/or are overwhelmed by the amount of responsibilities that they have, they are less capable of investing the necessary amount of time with their GAM patients and providing them the care proposed in the CPGs. Additionally, patient context and socioeconomic status, as well as hospital and specialist wait times are also considered
barriers that impact the effectiveness of the CPGs. Even when patients are motivated to engage in healthier behaviours, the lack of resources available to them can make it difficult to follow through with their prescribed treatment. The long wait times to see a specialist or get a test done at a hospital are weeks or months that physicians are not provided with the necessary support to perform their job properly. These are important factors to consider as there is literature that reports no correlation between CPG application and patient health improvement (Oude Wesselink et al., 2015; Worrall et al., 1997). In this case, physicians may be applying the CPGs as best as they can, however, these external factors impact patient behaviour and prevent patient health improvement.

When asked about facilitators, physicians mentioned that their own training/education and their patients were motivators to apply the CPGs. They also mentioned that when the proper resources and support are present (e.g. access to guidelines, multidisciplinary team, regional leadership), they were more capable of providing evidence-based treatment. Physicians emphasized the importance of having support from the regional, state, and federal Secretariat of Health as these state officials are gatekeepers for resources such as medication and multidisciplinary support. When the multidisciplinary teams are reliable and capable, physicians recognized that they filled a gap in their knowledge and help with patient education and treatment. In fact, access to a multidisciplinary team composed of a physician, nutritionist, physical activity specialist, psychologist, and nurse, was the most distinguishing feature of GAMs that were accredited compared to GAMs that were not accredited. This highlights the impact that external support can have on the GAMs and the health of patients. Support from these external entities allowed physicians to focus more of their time to organizing their health centre and caring for their patients according to their training. The importance of this support makes sense intuitively and converges with previous research showing that when the appropriate supports are in place, health staff job dissatisfaction decreased and quality of care increases (Aiken, Clarke, Sloane, & International Hospital Outcomes Research Consortium, 2002). However, these results differ somewhat from previous research investigating facilitators to CPG
application, whereby accessibility to guidelines and good communication to answer questions emerged as the most common facilitators (Salinas et al., 2011; Taba et al., 2012).

In addition to barriers and facilitators to CPG application within the GAM setting, many physicians talked about the importance of the patient-provider relationship. This reflects previous research on the patient-provider relationship, which has shown a good relationship to be an essential component of a successful partnership between patients and physicians (Nam, Chesla, Stotts, Kroon, & Janson, 2011). Physicians recognized that patients’ dedication to their GAM motivated them to invest more time and effort into those patients’ education and medical care because they had formed a relationship with them through the GAM. A facilitator to patient health improvement is effective communication between patient and medical provider, which can be fostered through a good patient provider relationship (Stewart, 1995).

Physicians also mentioned that when GAMs become accredited, they are more likely to receive resources (e.g. medications, glucometers), thus, increasing the likelihood that they will be re-accredited. This incentive is similar to outcomes-based funding where governing bodies financially reward service providers that have a positive and sustained impact on service users (Gold & Mendelsohn, 2014). However, another thing that must be considered in the GAMs is that this type of reward can be dependent on the relationship between physicians and their regional coordinators. Thus, physicians find themselves being impacted by the politics of the health system at various levels as GAM accreditation or may not translate into more resources.

Other factors to take into consideration when evaluating CPG application in the GAMs are the local myths and context of the patients. For example, the myth that insulin is harmful is one that physicians battle with as they try to educate their patients on treatment strategies. This belief may cause patients to abstain from using insulin when their physician prescribes it, which could affect their health. In an exploration of cultural beliefs, one study exploring Mexican adults’ attitudes and beliefs about T2D, de Alba Garcia and colleagues report that their participants had their own beliefs as to why
they got diabetes (2007). For example, susto (fright) and coraje (a sudden burst of anger) were mentioned as two of various reasons for T2D development in the Mexican adults that participated. Thus, Mexican physicians are faced with the challenge of respecting the cultural beliefs of their patients while also educating them on their health condition and how to properly manage it.

Because the biggest barrier to CPG application was lack of resources and lack of institutional support, it is important to note, once again, the relevance of KT in LMIC settings. CPGs represent a KT tool to increase the use of evidence in clinical settings. The lack of resources and support available for the application of CPGs highlights the “rich-poor gap” for KT strategies in LMIC contexts (Neufeld et al., 2001). This is the first study to use the CPGFI in a LMIC context and the first one to look at the barriers and facilitators to CPG application. The complexity of the Mexican health context is highlighted by the comments that physicians made regarding not only lack of resources, but institutional and cultural barriers that may impact their ability to use evidence-based practices. More studies that explore the use of evidence in LMICs can lead to development of tailored KT strategies that will increase the use of evidence to address the health disparities experienced in these contexts (Cordero et al., 2008; Gwatkin, 2003; Neufeld et al., 2001).

3.7 Recommendations

During the interviews, physicians were asked about what could be done to improve the application of CPGs in the GAMs and how to improve the GAM strategy as a whole. While improved medication availability and multidisciplinary support were the main wish-list items, physicians also suggested a need for guidelines that are more tailored to their context. As mentioned previously, the CPGs that GAM physicians receive can sometimes be perceived as inapplicable due to the context they are in. Physicians mentioned that creating a set of guidelines with recommendations that more accurately reflect the context of primary level health care would be beneficial and would inspire greater applicability of the CPGs.
In addition to more contextualized guidelines, some physicians mentioned that they should have more training and follow up opportunities. One physician mentioned, "I think that it would be good that at all levels of the state...when they give you a group, that they don't only give you the guidelines. But that someone takes charge, [teaches you] how to apply them" (W01). Having more training opportunities might increase the physicians’ awareness of how to implement the CPGs in their GAMs and also help them receive more guidance on how to coordinate their GAM.

A few physicians also brought up the idea of having a platform where success stories and strategies from different GAMs can be shared so that they can be applied in other GAMs with similar circumstances. One physician proposed that there should be “workshop or reunion with different physicians, nurses, health professionals, that have had success with their health centres so that their patients have reached metabolic control....and share different options...how it worked” (M13). This way, health professionals who are currently involved in the GAM strategy can share strategies and experiences that can help other GAMs.

3.8 Strengths

This study has several strengths. Using an integrated knowledge translation approach to plan and conduct this project was a main strength of this study. SSJ partners were not only key facilitators to carrying out this research, but they also helped shape the project into something that would be useful to the SSJ. Partnering up with SSJ officials also helped tailor the Spanish of the project to one that would be understood by participants. Another strength is the number of strategies that were used to constitute study rigour and credibility. The number of participants and the diversity in participant characteristics (years working with GAMs, level of GAM accreditation, location of GAM, etc.) gave a broad spectrum of what the GAM strategy looks like in Jalisco. The CPGFI (Cabana et al., 1999), which has been used to guide previous studies on CPG application, allowed the interview guide to be based upon proven constructs and the semi-structured nature of the interview guide allowed physicians
to expand on concepts if they wished to. Finally, I am bilingual which facilitated conversations with research partners, participants, critical friends, and locals in Mexico.

3.9 Limitations

There are notable limitations in this study. Firstly, while interviews took place in the physicians’ office to ensure privacy, interviews were constantly interrupted by nurses coming into the room, which affected the flow of the interview. Secondly, because interviews were conducted during work hours, sometimes physicians felt rushed during the interview knowing that patients were waiting to see them. Also, given that the SSJ is the employer of GAM physicians, some participants were hesitant to answer some questions, possibly compromising the truthfulness of their answers. Lastly, the quotes presented in this thesis were not back translated, which could have slightly altered the meaning of quotes.

3.10 Implications

To our knowledge, this is the first study exploring barriers and facilitators to CPG application in GAMs from a physician perspective. With obesity and related diseases becoming a more urgent problem, ensuring that evidence-based practices are used in clinical settings is important. However, because there is a dearth of literature about the use of CPGs in a Latin-American context, research findings of this study add a layer of understanding of possible barriers and facilitators in developing countries with similar contexts.

The use of the CPGFI, which had not previously been used in a Latin-American context, was effective in guiding an interview guide to identify the barriers and facilitators to CPG application. Presentations were given to SSJ officials and GAM physicians to 1) present findings of study and 2) give SSJ officials and GAM physicians an opportunity to confirm that the findings accurately reflected the barriers and facilitators to CPG application in the GAMs.
Collaboration between international research team members allowed for knowledge exchange at various points in the research process. SSJ officials were involved in the development of the study, in the data collection phase, and at the end of the analysis. A report was also written in Spanish describing the research project, methods, analysis, and results and submitted to SSJ officials for their records. Findings from this study could be used by SSJ officials to improve the GAM strategy and its implementation in the coming years. This is an example of how integrated knowledge translation can happen in an international context.

### 3.11 Future Directions

This study has increased understanding in one small part of the GAM strategy. More research investigating how the GAM strategy affects the patients’ health and other aspects of their lives is needed. It would be useful to explore what distinguishes health teams that have excellent GAMs from the rest in order to replicate the successful model throughout the country. It would be beneficial to find ways in which to increase health professionals’ commitment and dedication to patients. Developing a more holistic understanding of the GAM strategy, the gaps within it, and how to fill those gaps could inform a scheme to improve the GAMs.

### 3.12 Acknowledgements

I would like to acknowledge the contribution and guidance by our SSJ co-researchers and collaborators. This work was supported by a MITACS grant.
3.13 References


Chapter 4

General Discussion

4.1 Summary of the Findings

The current study explored barriers and facilitators to CPG application in Mexican GAMs from the perspective of physicians working in the GAM strategy. Although most of the GAM physicians mentioned being familiar with the CPGs for chronic diseases, knowing about the guidelines is not always enough to ensure proper CPG application (Salinas et al., 2011). Physicians can often feel overwhelmed by their numerous responsibilities and adhering to the CPGs may not be a priority, especially when conditions and circumstances make it difficult to do so. Physicians in this study mentioned a variety of factors that affected their ability to properly apply the CPGs in their practice. Shortage of medication was the most commonly mentioned barrier, however, lack of resources, lack of support from the Secretariat of Health, and a lack of training opportunities for physicians were also mentioned repeatedly. These findings are consistent with previous evidence regarding barriers to use evidence based methods (Larme & Pugh, 2001; Lugtenberg, Zegers-van Schaick, Westert, & Burgers, 2009; Salinas et al. 2011, Taba et al., 2012).

The facilitators mentioned by the GAM physicians go beyond those traditionally found in the research literature in this area, which maintain that effective leadership, good communication, and access to the guidelines are the main facilitators to CPG application (Ellen et al., 2014; Taba et al., 2012). When asked about facilitators to CPG application, physicians mentioned that when the support from the Secretariat of Health was provided (e.g. medication, medical resources, and multidisciplinary team), their job became easier. A main motivator to apply the CPGs were the positive results on patients' health. When physicians attributed improved patient health outcomes to their application of CPGs and when they had the necessary resources to apply them, they mentioned that they were more inclined to apply the CPGs. A few physicians also mentioned how their education allowed them to
understand the circumstances of their patients and motivated them to provide them with the best possible care. This dedication also drove some physicians to explore different ways of educating their patients so that they might be able to take care of themselves.

When talking about CPG application, physicians also mentioned their patients and the influence that patients have over the kind of treatment they receive. Some physicians mentioned that, because the patients in the GAMs are overwhelmingly from a low-economic status and have very low education levels, it is difficult to make them understand their condition. Some physicians reported making adjustments to the CPGs (e.g. giving patients erroneous information about the guidelines) to increase their motivation for health improvement. For example, a physician would tell patients that to maintain their blood glucose levels stable, they had to keep them below 90 mg/dl when the guideline says that below 100 mg/dl is still normal. Patients would then try even harder to engage in healthier behaviours and maintain their glucose levels below 90 mg/dl. This seems to reflect a type of paternalistic approach, where physicians maintain an authoritative role over their patients, which has been noted in previous work conducted in Mexican health care settings (Lozano & Vargas-Parada, 2015). However, it may simply reflect physicians taking into account their patients’ living situation. For example, even when patients are willing to learn and adhere to their treatment, they may not have the funds to buy medication if their health centre does not provide them. Or, even if they do get the medication, there are certain contextual barriers that can keep patients from following through with their treatment. For example, insulin has to be kept refrigerated, but not all patients have access to a refrigerator in which to keep their insulin, preventing them from properly following their treatment. These are some of the situations that physicians deal with in their regular practice that may indirectly impact the way they interact with patients and the treatments they prescribe.

Other physicians mentioned that, while it is sometimes difficult to get through to patients, taking time to do so and empathizing with them is essential to earn the patients’ trust. It has been well documented that a strong patient-provider relationship characterized by good communication and
partnership are facilitators for health improvement (Fox & Chesla, 2008; Nam, Chesla, Stotts, Kroon, & Janson, 2011). When the institutional support allows physicians to dedicate more time to their patients, they are more capable of building this relationship and creating an atmosphere where they are motivated to apply the CPGs and in which patients, in turn, are more likely to adhere to physicians’ recommendations.

In addition to barriers and facilitators to CPG application, physicians commented on the importance of considering the cultural context of Mexican patients. For example, physicians mentioned that there are myths about medications and about diseases that can prevent patients from seeking treatment. There is a myth that insulin is harmful and can make patients blind. Patients also tend to use home remedies given to them by their neighbours or “medication” sold to them on the streets instead of taking the medication prescribed to them by their physician. This could be for a variety of reasons such as the unaffordable prices of prescribed medications and/or a mistrust between patients and health professionals. Some patients may trust their neighbour’s medication over the medication prescribed by a medical professional who they don’t know well or don’t have a good relationship with.

4.2 Strengths

This study has several strengths. Using an integrated knowledge translation approach (Canadian Institutes of Health Research (CIHR), 2012) to plan and conduct this project was a main strength of this study. SSJ partners were not only key facilitators to carrying out this research, but they also helped shape the project into something that would be useful to the SSJ. Partnering up with SSJ officials also helped tailor the Spanish of the project to one that would be understood by participants. When conducting interviews, it was really helpful to have an association with the SSJ, which automatically gave credibility to the study and attracted the attention of physicians.

Another strength is the number of strategies that were used to constitute study rigour and credibility. The reflexive journal and notes taken throughout the project to document decisions that
were being made, reflections, and observations allowed for a greater understanding of the context when analysis was conducted (Baillie, 2015; Jootun, McGhee, & Marland, 2009). The involvement of critical friends was also crucial to the analysis phase as their comments and insight provided a different lens for analysis (Foulger, 2010). Critical friend questions also allowed for clarification of ideas. The presentation to SSJ officials and GAM physicians provided an opportunity to present research findings and also to confirm that findings accurately reflected the barriers and facilitators to CPG application in the GAMs.

The number of participants and the diversity in participant characteristics (years working with GAMs, level of GAM accreditation, location of GAM, etc.) gave a broad spectrum of what the GAM strategy looks like in Jalisco. Because eight of the 13 health regions of Jalisco were visited, a variety of health centre contexts were observed. To the best of our knowledge, this is the only study that has explored the GAM strategy at such diverse sites.

Finally, I am bilingual; this facilitated conversations with research partners, participants, critical friends, and locals in Mexico which provided important context for the research. Physicians who participated in the study were able to speak in their native language which allowed them to discuss their perspective on the GAMs and on the CPGs. Even after the recording had stopped, many physicians would continue to share thoughts they may not have wanted audio recorded; these comments were later written down as best as possible in field notes. Being able to converse with state officials was also important as they are the ones that conduct and manage the strategy at the state level. Interacting with locals also provided a real-world context and helped me to get a glimpse of what it is like to live in Mexico.

4.3 Limitations

There are notable limitations in this study. Firstly, while interviews took place in the physicians’ office to ensure privacy, due to the nature of health centres in Mexico, some interviews were constantly interrupted by nurses which affected the flow of the interview. Because interviews were
conducted during work hours, sometimes physicians felt rushed during the interview because they had to return to care for their patients. All of these factors from within the health centre could have affected the flow of the interview.

Working with the SSJ was a facilitator to the research project, however, the SSJ is the employer of GAM physicians. This could have created a conflict as some participants were hesitant to answer certain questions, possibly compromising the truthfulness of their answers. Although I tried to make sure that the participants knew that everything they said would be kept confidential and that their anonymity would be preserved, it is possible that they still felt like they could not truly speak openly about what’s happening in the GAMs. As a representative of the SSJ during data collection, I was also instructed to wear a white coat, to add formality and authority to the interview. This could have made the participants nervous as they could think that whatever they said would be available to SSJ officials and their jobs could be in jeopardy. I also visited some health centres accompanied by an SSJ official as the SSJ conducts evaluations on their health centres annually. During these interviews, the SSJ official introduced us and the research project. This could have put added pressure on participating physicians as their health centre was being evaluated while the interview was carried out and they could have thought that the interview was part of the SSJ evaluation.

4.4 Implications

To my knowledge, this is the first study exploring barriers and facilitators to CPG application in GAMs from a physician perspective. Furthermore, this is one of the few studies looking at the use of CPGs in a Latin-American context. Because of the rising obesity and chronic disease rates in Latin-America, it is important to investigate the use of evidence based practices in these settings. This study helps fill a gap in the literature and adds a layer of understanding of possible barriers and facilitators to CPG application in Mexico. Research findings can also provide researchers with insight on the health care conditions in developing countries, providing them with a base understanding of the barriers that they may come across. This study was also one of the first qualitative studies that the SSJ had been a
part of which may inspire more qualitative studies to further explore the GAM strategy from different perspectives.

The use of the CPGFI, which had not previously been used in a Latin-American context, was effective in guiding this project to get at the barriers and facilitators to CPG application. Because it had been used to investigate barriers to CPG application in previous studies, this framework was appropriate to use in this context. Questions based on constructs on the CPGFI were asked and the semi-structured nature of the interview guide allowed physicians the opportunity to discuss barriers that were specific to their contexts. These Mexican specific barriers can add a layer of understanding to the use of evidence-based practice in an LMIC context.

The research partnership between Queen’s University and the SSJ allowed for a constant exchange of knowledge, resources, and results. Presentations were given to SSJ officials and GAM physicians to 1) present findings of study and 2) give SSJ officials and GAM physicians an opportunity to confirm that the findings accurately reflected the barriers and facilitators to CPG application in the GAMs. After this presentation, SSJ officials were also able to hear the physicians’ perspective directly as physicians commented on their experience in the GAMs. A report was also written for the SSJ to use at their discretion, which will hopefully lead to greater resources being allocated for the GAM strategy to address physicians’ concerns.

4.5 Future Directions

This study has increased our understanding of one small part of the GAM strategy. By identifying the barriers and facilitators to CPG application, there’s a greater likelihood that the barriers will be addressed and the facilitators enhanced. However, more research investigating the GAM strategy is needed. More exploration is needed to determine the ideal characteristics and training of a GAM coordinator; this could provide a profile that could help regional or state officials to recruit capable and effective people to lead the GAMs. Investigations on how the GAM strategy affects the patients’ health and other aspects of their lives are also needed. Exploring about what distinguishes
health teams that have excellent GAMs from the rest, beyond CPGs, could help create and replicate an "improved GAM" model throughout the country. All of these and more could provide a more holistic understanding of the GAM strategy, the gaps that exist within it, and how to fill those gaps to improve the strategy.

4.6 Conclusions

This research contributes to the understanding of CPG application within the GAM strategy. The findings provide insight into the complexity of providing adequate patient care and support through the GAMs in an austere environment. Despite many challenges mentioned by the physicians, several creative solutions were shared, and many patient successes were showcased, suggesting that there are many things working within the GAM model. Finally, the recommendations offered by the physicians offer a call to action for the Secretariat to further examine actionable areas for change to enhance GAM efficiency and effectiveness.
4.7 References


among physicians in Estonia. *BMC Health Services Research, 12, 455.*

https://doi.org/10.1186/1472-6963-12-455
Appendix A
Ethics Clearance

September 28, 2016

Ms. Carla Tanseira
Master’s Student
School of Kinesiology and Health Studies
Queen’s University
28 Division Street
Kingston, ON, K7L 3N6

GREB Ref #: GSKHS-235-16; TRAQ # 6019270
Title: "GSKHS-235-16 Exploring the Barriers and Facilitators to Clinical Guideline Implementation in Mexican Mutual Aid Groups"

Dear Ms. Tanseira:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "GSKHS-235-16 Exploring the Barriers and Facilitators to Clinical Guideline Implementation in Mexican Mutual Aid Groups" for ethical compliance with the Tri-Council Guidelines (TCPS 2 (2014)) and Queen’s ethics policies. In accordance with the Tri-Council Guidelines (Article 6.14) and Standard Operating Procedures (805.001), your project has been cleared for one year. You are reminded of your obligation to submit an annual renewal form prior to the annual renewal due date (access this form at http://www.queensu.ca/trac/simmon.html; click on "Events"; under "Create New Event" click on "General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies"). Please note that when your research project is completed, you need to submit an Annual Renewal/Closure Form in Romeo/traq indicating that the project is completed so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one year period (access this form at http://www.queensu.ca/trac/simmon.html; click on "Events"; under "Create New Event" click on "General Research Ethics Board Adverse Event Form"). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To submit an amendment form, access the application by at http://www.queensu.ca/trac/simmon.html; click on "Events"; under "Create New Event" click on "General Research Ethics Board Request for the Amendment of Approved Studies". Once submitted, these changes will automatically be sent to the Ethics Coordinator, Ms. Gail Irving, at the Office of Research Services for further review and clearance by the GREB or GREB Chair.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Sincerely,

John Freeman, Ph.D.
Chair
General Research Ethics Board

cc: Dr. Lucie Levesque, Supervisor
    Dr. Lucie Levesque, Chair, Unit REB
Appendix B
Interview Guide

Welcome: Thank you for taking time out of your day to speak with me today. I am a student at Queen’s University that is working with the Secretariat of Health of Jalisco to explore the barriers and facilitators to clinical practice guideline application from the perspective of physicians working on the GAMs. We thought you’d be a good participant for this research as you are a physician that works with a GAM and your opinion is very important to us. You are free to skip any questions that you don’t feel comfortable answering and you can stop the interview if you feel uncomfortable at any point.

Do you have any questions about before we begin?

[ASK PERMISSION TO START RECORDING]

Introductory questions:
- How long have you known about and worked in the GAM?
- How long have you been coordinating a GAM?
- How long have you been coordinating this GAM?
- Why did you want to become GAM coordinator?
- Can you tell me a bit about the GAM? (What are the GAM? What’s their purpose?)
- Can you tell me about the work dynamic at your work? (How many health professionals are there? What health staff support you? How many times do you get together as a GAM? What’s the social dynamic? Etc.)
- Ever since you became coordinator, how do you feel about the work dynamic in the health unit? (Cordial, complicated, collaborative?)
- Do you have an interdisciplinary team? (List the professions involved)
- Are they from the jurisdiction or the health unit?
- Do you know about the benefits for a GAM patient?

Knowledge questions:
- Which of the clinical practice guidelines do you consider to be most applicable to the GAM? (Mention at least 2)
- Do you have them on hand at the health unit?
-Which aspect of the guidelines do you consider most important? (exercise prescription, nutritional recommendations, medication adherence, education about health and disease, etc.)
-Why that one and not the other ones?

**Attitude questions:**
-What do you think about the clinical guidelines? Why? (Are they credible? Are they based in evidence? Do you think they help you do your job well?)
-How do the guidelines influence your clinical practice? (Mention 3 aspects)
-How important is it to follow the clinical guidelines? Why?
-How do you think following the guidelines affects the quality of care? Have you seen their effects in the health of the patients?
-On a scale of 0 to 100, 0 being “not capable” and 100 “very capable”, how capable are you to implement the clinical guidelines? Why?
-What motivates you to follow the clinical guidelines? Why? Are there incentives to follow them?

**External barrier questions:**
-What aspects of the GAM help you to implement the clinical guidelines? (location, people, incentives, norms, infrastructure, other duties, time, social influences, etc.)
-What aspects of the GAM make it difficult for you to implement the clinical guidelines? (location, people, incentives, norms, infrastructure, other duties, time, social influences, etc.)

LET PARTICIPANTS KNOW THAT INTERVIEW IS ALMOST FINISHED.

**General GAM questions:**
-In your opinion, what aspects are needed to increase the implementation of the clinical guidelines? (Training, resources and personnel, etc.)
-In your opinion, what does it take to achieve GAM success in general? What facilitates the success of a GAM? (material support, personnel, lab work, etc.)
-What would help you and your team achieve your goals for your GAM?
-Is there anything else you’d like to add?

END RECORDING.
THANK PARTICIPANTS FOR THEIR TIME AND ANSWERS.
Appendix C
Letter of Informed Consent

Project title: Exploring the Barriers and Facilitators to Clinical Guideline Implementation in Mexican Mutual Aid Groups.

Researcher: Carla Teixeira, School of Kinesiology and Health Studies, Queen's University, Canada.

I am a graduate student working under the supervision of Dr. Lucie Lévesque.

Purpose:
Type 2 Diabetes (T2D) has become one of the world's leading causes of death and, among low and middle income countries, diabetes rates are skyrocketing. The Grupos de Ayuda Mutua (GAM) are a national policy in Mexico developed to help with diabetes and other chronic disease management. While much work has been done in the field of diabetes management, global and national clinical practice guidelines are constantly updated and made available to health professionals. When these guidelines are applied to actual clinical practice, however, they are sometimes difficult to follow due to a variety of reasons. The aim of this study is to investigate the barriers and facilitators to clinical practice implementation from the perspective of health professionals involved in the GAMs. Findings from this research can help uncover aspects of the GAM policy that are benefiting and hindering health professionals from providing the best quality of care possible. These findings could then be used to make applicable changes to ensure a higher quality of care and patient health improvement in Mexico.

You are invited to participate in this study. By agreeing to participate in this study, you are allowing me to interview and ask you questions about your experience in the GAMs and the GAM clinical practice guidelines. You will be interviewed by Carla Teixeira in person at a private location convenient to you for about 90 minutes. The interview will be audio-recorded so that it can be transcribed accurately and analyzed. If at any time you wish to speak off-the-record, please tell me to stop the audio recorder. When you are finished speaking off-the-record, let me know and I will start the audio recording again.

Your signature indicates that you are consenting to participate in this study and be
interviewed in person, via telephone, or video chat. There are no known risks to participating in this study.

*Your participation is voluntary and you can choose to not answer any of the questions. During the interview you may withdraw at any time. Following the interview, you may withdraw the information you have provided me within three months of consenting to participate in this study. To withdraw during the interview, simply tell me that you wish to withdraw and your data will be destroyed. If you choose to withdraw after the interview, please email me, Carla Teixeira at carla.teixeira@queensu.ca within three months to delete your information.*

Although SSJ officials, including Dra. Edtna Jauregui, may be aware of your participation in this study, they will not have access to the recording from your interview. They will only have access to a de-identified transcript. The recordings will stay in an encrypted folder in a password protected computer at Queen’s University and will only be accessible to the Queen’s University research team to protect your identity. Any interview notes will also be kept in a password protected computer at Queen’s University and will be destroyed five years after findings have been published.

*A participant code will be created for your interview in order to protect your identity and privacy. Overarching themes will be analyzed and may be presented in reports, publications, and conferences. Verbatim quotes may be used in presentations to highlight a theme that came up in the interviews; however, any identifiable information in quotes will be removed. I might share de-identified research data (information you and other participants have shared with me that has all information that can identify you removed) with other researchers for future research purposes.*

If you have any questions about this study, you can ask me or if you think of any questions at a later date, you can email me, Carla Teixeira at carla.teixeira@queensu.ca, or my supervisor, Dr. Lucie Lévesque, at levesquil@queensu.ca. If you have any ethical concerns you may contact the Chair of the Queen’s University General Research Ethics Board (GREB) at 1-844-535-2988 or chair.GREB@queensu.ca.

This study has been granted clearance by Queen's University General Research Ethics Board according to Canadian research ethics principles (http://www.ethics.gc.ca/default.aspx) and
Queen's University policies (http://www.queensu.ca/urs/research-ethics). This study has also been granted ethical approval from the SSJ Research Ethics Board.

Your signature below indicates:

- You understand what is being asked of you,
- You have had any questions answered to your satisfaction,
- You understand that you can withdraw your participation from this study at any time during the interview and up to three months after the interview by communicating with me via email,
- You understand who to contact for more information or if you wish to speak to an impartial 3rd party, and
- You freely consent to participate in this research project.

Printed Name:___________________________________________

Signature: ___________________________________________ Date:_________________

*****Please keep a copy of this letter for your records.*****