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Understanding the Effects of Occupational Stress and Familial Stress on Diabetes Management

Among Aging Working Latinas with T2DM

A dissertation submitted in partial satisfaction of the

requirements for the degree Doctor of Philosophy

in Nursing

by

Stephanie Michelle Pavon

2020

ABSTRACT OF THE DISSERTATION

Understanding the Effects of Occupational Stress and Familial Stress on Diabetes Management

Among Aging Working Latinas with T2DM

by

Stephanie Michelle Pavon

Doctor of Philosophy in Nursing

University of California, Los Angeles, 2020

Professor Wendie A. Robbins, Co-Chair

& Professor MarySue V. Heilemann, Co-Chair

Background: As a self-managed disease, T2DM can be expensive and time consuming to manage. Disease management can be particularly challeging for Latinas who are paid 54 cents for every dollar paid to white, non-HIspanic men. Coupled with long hours employed outside the home, while still maintaining a traditional division of household labor - managing one's health can prove stressful and daunting. **Purpose:** The purpose of this exploratory study was to understand the effects of occupational and familial stress on T2DM management among aging, working Latinas. **Methods:** This was a cross-sectional, correlational study.   Fifty working Latinas, 21-years and older with T2DM were recruited using convenience and snowball sampling throughout community sites in Southern California. . **Sample:** Initially 10 women completed in-person interviews and HbA1c blood samples. . Following COVID-19 research

restrictions, an additional 47 women completed questionnaires on-line and self-reported their HbA1c. Seven of the 47 self-reporting women did not report HbA1c giving a final sample for analyses involving HbA1c levels was 50. **Results:** Approximately, 52.6% of women reported psychological distress/strain (mild-moderate distress: 15.8%; 19.3% distress; severe distress: 17.5%) and 83% reported job strain. Overall, mean body mass index was 31.21 ± 9.38, with 56.2% women having at-risk/high risk BMIs. BMIs were higher in women $\geq$40 years of age (BMI 34 ± 10.23) compared to women under the age of 40 (BMI 27.73 ± 6.90),difference of 6.27 (95% CI, -10.77 to -1.65), $t(54) = -2.73$, $p = .009$. Of the women over 40, 62% had high risk BMI's ($\geq$25; obesity class I). Although, 73.7% of participants were given a diet plan from their primary care provider (PCP), 62% of those given a diet plan had uncontrolled HbA1c test levels. Furthermore, 53.5% reported poor medication adherence, 65% reported not checking their feet daily, 31% reported never having an eye exam – all of which are quality indicators of T2DM management. **Conclusion:** There is a disconnect between healthcare service providers and T2DM management among Latinas. This divide can further increase health disparities, increase the burden of illness, and lower the quality of life among working Latinas with families. This study will fuel future studies to develop culturally appropriate interventions that improve management of diabetes within this understudied population.

The dissertation of Stephanie Michelle Pavon is approved.

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2020

This dissertation dedication is to the women that have inspired me to do and be better.

"Always ask questions - question everything."

- Elizabeth Gruber II (Oma)

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Acknowledgements

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2004	ULV, "Psi Chi Honor Society Award"

<center>**Chapter 1**</center>

<center>**Introduction**</center>

In 2017, Latinos represented 18.1% (58.9 million) of the population United States (U.S.) making them the largest ethnic minority group within the U.S. However, the number of U.S. Latinos will more than double (119 million) by 2060 (U.S. Census Bureau, 2018). Type II Diabetes Mellitus (T2DM) is the 5th leading cause of death among Latinos and is fast becoming a major public health concern (CDC, 2015). A healthy diet and proper self-management of disease is vital for those diagnosed with T2DM. The epidemic of T2DM and poor diabetes management disproportionately afflicts Latinos. As compared to non-Hispanic white Americans (8%), Latinos are more likely to have T2DM (17%) (CDC, 2019). And, the prevalence of T2DM among Latino women is slightly higher (17.2%) (Daviglus, Pirzada, & Talavera, 2014; Aguayo-Mazzucato, Diaque, Hernandez, Rosas, Kostic & Caballero, 2019). Over their life-course, Latinos are more likely to receive a T2DM diagnosis at a younger age as compared to white non-Hispanics. They also have a more than 50% chance of developing T2DM within their lifetime (CDC, 2020) and have an increased risk of death from diabetes related complications by 50% (CDC, 2015; Hu, Shi, Rane, Zhu, & Chen, 2014).

As a self-managed disease, T2DM can be expensive and time consuming to manage. With high rates of diagnosed diabetes (12.1%), the economic and physical costs of diabetes management among Latino families can be debilitating. A study from the American Diabetes Association (2013), estimated that the total estimated cost, on average, for an individual diagnosed with diabetes is 2.3 times more than those without a diabetes diagnosis. Furthermore, in 2012, the U.S. spent over $327 billion on diabetes related expenditures, with 69 billion of that in lost productivity (ADA, 2017).

<center>1</center>

Among Latinos, the cultural value of "familia," is an important and influential social structure that refers to the behavior of prioritizing family over self (Schwartz, 2007). Latinos, more specifically Latinas, have reported feeling a sense of guilt and selfishness when they put their personal healthcare needs before that of their family's (ADA, 2013). Managing one's health while running a family can be difficult, however, adding paid work to one's roles and responsibilities can prove daunting. Many women engage in long hours employed outside the home, while still maintaining a traditional division of household labor (Wang, Parker, Taylor, 2013). In the workplace, Latinas are paid only 54 cents for every dollar paid to white men (NPWF, 2017) and 30% less than white women. And the wage gap widens for Latinas with age and education (Lean In, 2020).

Furthermore, the wage gap is even worse for Latina *mothers*, who are paid 45 cents for every dollar white fathers get paid – that is 55% reduction in income (Lean In, 2020). The loss of income not only affects basic family necessities like food, medicine, and rent that are connected to well-being and health. But, these effects overtime have long-term effects on a family's ability to invest in education, property and savings (Lean In, 2020). Approximately 38% of Latina single-headed families live below the poverty level (Grey & Hall-Clark, 2015; U.S. Census Bureau, 2016). Coupled with lower pay, stress and other noxious elements, work can negatively affect the health and overall well-being of Latinas.

According to the CDC (2014), Hispanic/Latinos living in the U.S. have longer life expectancy than both white and black Americans. In fact, the average life expectancy for Hispanic/Latina women (84 years), is on average 2.9 years longer than white women and 5.9 years longer than black women (CDC, 2014). Type 2 diabetes mellitus develops most often in middle-aged adults. However, Latinos/Hispanics are more likely to develop it at a younger age

(CDC, 2018; National Diabetes Stats, 2017), due to the increased incidence of risk factors such as obesity, sedentary lifestyle, and genetics. According to the CDC (2018), 12.4% of Latina/Hispanic women, 18 years and older are diagnosed with diabetes as compared to 7.5% non-Hispanic white women. Utilizing a life-course approach to aging, helps one better understand the complex and varied process of aging within this population (Hanson, Cooper, Sayer, Eendebak, Clough, & Beard, 2016). Although, Hispanics/Latinos have an overall longer life expectancy, they have lower quality of life and worse educational outcomes from an earlier age that have an major cumulative implications later in life (Escarce, Morales & Rumbaut, 2006; Garcia, Downer, Crowe & Markides, 2017). Latinos are 50% more likely to die from diabetes than non-Hispanic whites (CDC, 2015). In fact diabetes, is the 5th leading cause of death among Hispanic/Latinos. Studies have shown that lower SES and/or ethnic minority groups, like Hispanic/Latinos, have a higher prevalence (66%) of diabetes and are more likely to suffer diabetes-related complications and hospitalization than non-Hispanic whites (CDC, 2015; Chiu & Wray, 2010; Link & McKinlay, 2009; Heisler, Smith, Hayward, Krein, & Kerr, 2003; Hu, Shi, Rane, Zhu, & Chen, 2014; Karter, Ferrara, Liu, Moffet, Ackerson, & Selby, 2002; Krishna, Gillespsie, & McBride, 2010; Kirk et al., 2008; Otiniano et al., 2012; Smedley, Stith, & Nelson, 2002; Weinstock et al., 2011; WIN, 2013). Possible social factors, such as, language barriers, low education attainment, low or no health insurance, and poverty may explain this major ethnic-disparity. However, with the current state of political unrest and rampant deportation, racial/ethnic disparities in diabetes quality of care in the United States will be further exacerbated as Hispanic/Latinos may fear deportation or discrimination, thereby, not seeking the appropriate care necessary to manage their disease. As Latinos are currently more likely to seek care when symptoms are severe as evidenced by higher prevalence of poor glycemic control (Resnick et al.,

2006), higher rates of health complications (Otiniano et al., 2012), and increased incidence of morbidity & mortality (Beard et al., 2009).

Furthermore, based on the review of the literature, it is clear that there are currently no identified studies that explore the effects of occupational stress and familial stress on diabetes self-management among aging, working Latinas with T2DM. Several qualitative studies described themes regarding multiple role demands among Latinos with diabetes. No published literature on work and T2DM management among Latinas were specifically identified. However, themes of work as a barrier to adherence did arise within the literature.

The NIH (2014) reported that within healthcare the knowledge of Latino health is meager and insufficient. Doty and Holmgren (2006) explain there is a major disconnect between Latinos and the healthcare system. A landmark study with 16,415 Latinos found that only about half of individuals with diabetes among all Latino groups had it under control (Schneiderman et al., 2014). A cross-sectional analysis conducted with 111 adolescent and adult, U.S. Latinos found that respondents would only seek medical care for their diabetes, upon the onset of symptoms (52%) or with severe symptoms/crisis (41%) (NAHH, 2010). This disconnect is dangerous as evident by the prevalence of diabetic complications that effect this population such as diabetic retinopathy, diabetic nephropathy, end stage renal disease (ESRD), diabetic foot syndrome, and gestational diabetes (Chukwueke & Cordero-MacIntyre, 2010). A lack of culturally proficient health care and understanding of Latino health, widens the divide between patient and provider. This divide can further increase health disparities, increase the burden of illness, and lower the quality of life among working Latinas with families.

With a well-developed understanding of the relationship between occupational stress and familial stress on glycemic control, we can better inform healthcare providers about familism and

the behavioral effects work and family stress have on T2DM self-management among aging, working Latinas. As this is an understudied population, there are gaps in the literature regarding the effects of familism, occupational stress, and familial stress on glycemic control. The results of this study will fuel future studies to develop culturally competent interventions that encourage work designs that improve successful self-management of diabetes within this understudied population.

In an effort to decrease health disparities and close the healthcare disconnect among Latina women with T2DM, the findings of this study will help inform future population-level interventions. Therefore, primary aim of this research study was to explore the association between occupational and familial stress and diabetes management among aging working Latinas with T2DM. The secondary aim was to understand if family/friend support is associated with glycemic control among aging, working Latinas with T2DM.

During the early stages of recruitment, the coronavirus (COVID-19) pandemic hit the United States, altering the course of the study. Due to the study's population being considered high-risk, specific changes were made, which included: converting the entire study to an online digital (no-contact) platform and expanding the age range of participants in order to enhance recruitment.

The aims and hypotheses for this study were explored in a population of working Latinas aged 21 and older with Type II Diabetes Mellitus:

Primary Aim: To explore the association between occupational and familial stress and diabetes management among working Latinas with T2DM.

Secondary Aim: To explore if family/friend support is associated with glycemic control among aging, working Latinas with T2DM.

Hypothesis 1: Higher scores on the *Home Demands* and *Control at Home* scale will be associated with an HbA1c greater than 7.0%.

Hypothesis 2: Higher scores on the *Job Content Questionnaire* will be associated with an HbA1c greater than 7.0%.

Hypothesis 3: Lower *Family Support Inventory for Workers* scores will be associated with an HbA1c greater than 7.0%.

Hypothesis 4: Severe distress scores will be associated with an HbA1c greater than 7%.

Chapter 2

Literature Review

To identify factors associated with poorly managed T2DM in older working Latinas, a systematic review of literature published from 2005-2015 was conducted. This chapter discusses the main contributing factors for uncontrolled and/or poorly managed T2DM in aging working Latinas. Attention was focused on factors that are key to the development of culturally appropriate, age sensitive and gender specific interventions that encourage early detection and improve management of T2DM within this population. The purpose of this systematic literature review was to understand the factors that influence diabetes management among aging, working Latinas with T2DM.

Two Literature Searches

Two literature searches were conducted for this study. The first literature search was conducted to identify factors associated with poor glycemic control among aging Latinas with T2DM. The second literature search was conducted to understand the barriers that influence diabetes management among aging, working Latinas.

Both literature searches utilized six health databases: Cinahl Plus, Cochrane Library, PsycInfo, PubMed, Wiley Online Library and Google Scholar. Key search words included: T2DM, diabetes, management, risk factors, poor glycemic control, uncontrolled diabetes, Hispanic women, Latinos, Latinas, women, aging, older, stress, perceived stress, strain, demand, occupational, work, job, familismo, family, marianismo, support, and barriers. Initially, the online search produced limited literature on this particular population: older working Hispanic/Latina women. Therefore, two strategies were utilized to obtain more articles. First, a backwards reference search was conducted; this is where a search of the reference list of

pertinent articles were examined and selected. Second, the literature search was broadened to include all Hispanic/Latino adult age groups and genders. A systematic review of both quantitative and qualitative studies was conducted, and studies were selected based on inclusion criteria. A mixed studies review was utilized to synthesize the results.

Of the 1023 journal articles that resulted from the first search, 41 applicable journal articles were selected and reviewed - 18 articles met the age and gender inclusion criteria. Upon review, eight articles were excluded because the study sample populations were predominately another race/ethnicity (not Hispanic or Latino). After, filtering the remaining articles, 10 met the predetermined inclusion criteria.

The second literature search yielded 1769 journal articles, 24 relevant journal article were selected and reviewed. Nine articles met the gender and ethnicity inclusion criteria. Eight of the nine articles where qualitative and one was a quantitative study. The ten articles utilized in this literature review, were published between May 2007 and October 2015. Refer to Table 1.1: *Inclusion Criteria & Yielded Results* for further details.

Table 1.1: Literature Review Inclusion Criteria & Results

	Method A	Method B
Inclusion Criteria	• Factors associated with poor glycemic control. • Predominantly ($\geq$50%): female, $\geq$55 yrs. old, Hispanic and/or Latino nativity or descent.	• T2DM self-management barriers. • Predominantly ($\geq$50%): female & Hispanic and/or Latino nativity or descent.
Article(s) Identified	1023	1769
Article(s) Reviewed	41	24
Article(s) Yielded	10 (10 Quantitative, 0 Qualitative)	9 (8 Qualitative, 1 Quantitative)

Organization of the Results

Three main concepts from the Reserved Capacity Model (RCM) were utilized to organize the findings of this literature review: 1) Socio-cultural Context, 2) Psychosocial Risk & Resilient

Factors, and 3) Health Risks Factors (behavioral/physiological). The first section is Socio-cultural context, the theoretical framework RCM begins with this major concept, which consists of two subcomponents, socioeconomic status (Gallo & Matthews, 2003) and cultural context (Gallo et al., 2005). This literature review utilizes socio-cultural context to frame four sub-components: Ethnicity, Women, Middle-Age, and SES-Factors.

Socio-Cultural Context

Ethnicity. Latinos represent the largest ethnic minority group within the U.S. (U.S. Census Bureau, 2014). In 2016, Hispanic/Latinos represented 18% (58 million) of the U.S. population (Flores, 2017), and this number will nearly double (106 million) by 2050 (CDC, 2013; Cohn, 2015; Ennis, Rios-Vargas & Albert, 2011). The CDC (2016) reported that the age – adjusted percentage of Latino persons 18 years of age and over diagnosed with diabetes is 12.2%. Despite medical advances in the diagnosis and treatment of most chronic diseases, like diabetes, research indicates that racial and ethnic minorities receive lower quality care than non-minorities (Egede, 2006; Hu, Shi, Rane, Zhu, & Chen, 2014). Within the U.S., the Latino diabetes death rate is 26.3 per 100,000 (CDC, 2013). In fact, patients of minority-ethnicity groups experience greater morbidity and mortality from various chronic diseases than non-minority whites (CDC, 2013; Chiu & Wray, 2010; Link & McKinlay, 2009; Kirk et al., 2008; Otiniano et al., 2012; WIN, 2013; Weinstock et al., 2011). Furthermore, it was reported in the National Institute for Health (2014) that 1 in 3 Latinos had pre-diabetes and only 50% of those with diagnosed T2DM had it under control (NIH, 2014).

Women. Several research organizations regard health issues specific to women as additional risk factors for developing diabetes later in life, such as: pre-gestational diabetes, gestational diabetes, polycystic ovary syndrome (PCOS), and giving birth to a baby weighing >

9 pounds (Mayo Clinic, 2014; NDEP, 2014; NIH, 2014). According to research conducted by NIH, women who experienced gestational diabetes during their pregnancy have a 20-50% increase of developing T2DM later in life (NIH, 2006). A recent cohort study examined the prevalence and trends of pre-gestational diabetes among 655,428 pregnancies in Northern California from 1996-2014. The study found that Hispanic women had the largest relative increases of pre-gestational diabetes (121.8% [95% CI, 84.4e166.7]) and the highest prevalence rate (34.7%) among all race/ethnic groups (Peng, et al., 2017). Many studies have found that women are at an increased risk of disease related complications that lead to other comorbidities, such as heart disease (CDC, 2013; Huxley, Brazi, & Woodward, 2006; NAHH, 2010; Otiniano et al, 2003). In general, women with diabetes are 50% more likely to die of a myocardial infarction than men. Moreover, research has found that women have lower survival rates post-myocardial infarction and their quality of life is also decreased much more when compared to men (CDC, 2013; Hu et al., 2001; Huxley, Brazi, & Woodward, 2006; Lindeman et al. 1998). Bucholz, Normand, Wang, Ma, Lin, and Krumholz (2015) conducted a prospective cohort study with 146,743 patients with AMI and found that women lost 10.5% (SE 0.3%) more of their remaining life than men post-AMI. A meta-analysis of 64 cohort studies found that diabetes pose a significantly greater stroke risk to women than it does for men (Peters, Huxley, & Woodward, 2014). Due to the significant stroke risk in women with diabetes, Almdal et al. (2004) suggests the first ten years post-menopause requires more aggressive preventative care. Overall, diabetes mellitus is connected to a reduced life span, with women's longevity being 8.2 years less than those without diabetes, as compared to men who average 7.5 years less (Mozaffarian et al., 2015).

Middle Age. Due to diabetes being an age related disease, it is affecting 26.9% (10.9 million) of Americans 65 years and older (ADA, 2011; CDC, 2013). As the baby boomer generation ages this number is projected to increase in the coming years (CDC, 2013). Latinos will encompass 20% of baby-boomers, those of Mexican decent representing the majority (Ennis, Rios-Vargas & Albert, 2011). Contrastingly, three separate RCT conducted by Benoit et al. (2005), Kollannoor-Samuel et al. (2011a), and Lerman et al. (2004) found that older-age was not found to be a risk factor; rather, middle age was a risk factor associated with poor glycemic control among Latinos. Lerman et al. (2004) correlated this to poor adherence to treatment. Additionally, Benoit et al. (2005) found that participants 50 and younger had the highest HbA1c values. With those 65 and older having the lowest (Benoit et al., 2005). Conversely, other studies have shown that older Latinos with diabetes are more likely to seek care when symptoms are severe as evidenced by a higher prevalence of poor glycemic control, higher rates of health complications and an increased incidence of morbidity and mortality (Bonds et al., 2003; Brown et al., 2003; Otiniano et al., 2003; Caballero & Tenzer, 2007; Otiniano et al., 2012). However, Kollannoor-Samuel and colleagues (2011a) found that middle-aged adults were 2.2 times more likely to have higher HbA1c values as compared to elder adults. In fact, two studies found that the major issue that afflicted older adults was HbA1c values that fluctuated (Benoit et al., 2005; Kollannoor-Samuel et al., 2011a). Kollannoor-Samuel et al (2011a) associated this unexpected finding with the lower incomes and being uninsured among younger middle-aged participants. Latinos tend to be diagnosed with T2DM at a younger age than the non-Hispanic white population (NIH, 2014). In 2011, the median age at diagnosis of diabetes for Latinos was 49.4 ± 2. The mean age from 1997-2011 is 47.4 ± 1.56 (CDC, 2013).

SES Factors. Socioeconomic factors such as being uninsured, low-income, minimal education, foreign-born and Spanish speaking, where found to be factors for poor glycemic control (Benoit et al., 2005; Kaushik et al., 2007; Kollannoor-Samuel et al., 2011a; Kollannoor-Samuel et al., 2011b; Lasater et al.; 2001; Otiniano et al., 2012). Those participants that were uninsured had a 5.2% increase in their HbA1c values in the Benoit et al. (2005) study. Similarly, Kollannoor-Samuel et al. (2011a) found that being uninsured and having a low monthly income influenced long-term glycemic control. In addition, poor glycemic control was significantly associated with low education attainment (<8 years)(Otiniano et al., 2012). Contrary to the Otiniano et al. (2012) study, Kollannoor-Samuel et al. (2011a) did not find a significant association between education and high HbA1c values. Two secondary analyses conducted by Kaushik et al. (2007) and Otiniano et al. (2012) identified foreign-born participants at an increased risk for disease complications associated with poor glycemic control. Also, one study found that Spanish-speaking patients with Spanish-speaking providers had better glycemic control than with English-speaking providers (Lasater et al., 2001). Not surprising, the Lasater et al., (2001) study also found that Spanish-speaking participants rated patient-provider communication less favorably than English-speaking patients.

Psychosocial Risk & Resilience Factors

Gender Role Demands. According to Reedy (2009), Marianismo is the opposite cultural construct of machismo. It is a strong cultural-specific gender role that influences gender identity in some Latina women populations. Marianismo and machismo are distinct gender specific roles/expectations that are rooted in cultures that adhere wherein, these roles are perceived as obligatory and necessary for the family unit (Reedy, 2009). Generally, marianismo emphasizes Virgin Mary-like characteristics, such as, family-centeredness, selflessness, and self-sacrifice

(Gil & Vasquez, 1996; D'Alonzo, 2012). According to D'Alonzo (2012), Latinas with strong gender beliefs are more likely to exhibit behavior that prioritizes family over their own healthcare needs. Perceived stress and cultural-specific gender roles were also identified as possible barriers for disease self-management among Latinas living with T2DM (Clark et al., 2009; Fort et al., 2013). Three separate qualitative studies had clear identifiable themes of Latinas experiencing difficulty balancing familial expectations and T2DM lifestyle changes (Carbone et al., 2007; Hu et al., 2014; Kaltman, 2015; Mansyur, C., Rustveld, L., Nash, S. & Weiss, M., 2015; Weitzman et al., 2013). One participant is quoted as paraphrasing her PCP's frustration with her T2DM management, "You take care of your husband, but you don't take care of yourself…" (Fort et al., 2013, p.7). These findings correspond with another study that identified multiple role demands, as well as, limited family support as barriers to healthcare maintence and disease management (Bryant et al., 2010). Furthermore, the SOL study, a comprehensive longitudinal multicenter community–based cohort study includes four major Latino/Hispanic communities within the U.S., among the 4,000 Latinos living in San Diego they found that less than half of the women between the ages of 45-64 had their diabetes under control (HCHS/SOL, 2013; NAHH, 2014).

Familial Role Demands. Within the Latino population the cultural value of "*familismo"* or familism is a very important and powerfully influential social structure (Malley-Morrison & Hines, 2004; Qualls & Zarit, 2009). Schwartz (2007) simply defines it as, "prioritizing one's family over oneself" (p. 101). According to the American Diabetes Association (2013), *Por Tu Familia,* Latinos tend to feel a sense of guilt and selfishness when they put their personal healthcare needs before that of their family. Another study showed that Mexican-Americans exhibited higher stress in cultural and familial conflict as compared to their white counterparts

(Salgado de Snyder, Cervantes, & Padilla, 1990). Furthermore, Nolle et al. (2012) and Riveria et al. (2009) pointed out that strong familistic characteristics could potentially cause high levels of stress when there is distress or conflict within the family. Latinos often live in multiple person household's to help spilt costs and extend resources. However, Clark and colleagues (2009) identified family environments as a source of stress, with one participant stating, "when there's that many people in a family there's something going wrong with somebody at all times" (p. 390). Rodriquez et al. (2007) goes on to state that research has focused little on the possible source of conflict and potential stressful aspects non-supportive families can produce. D'Alonzo (2012) asserts that family prioritization over self, can lead to neglect of one's healthcare needs, specifically with health promotion behaviors. Due to diabetes being a self-managed disease, a combination of high stress and family prioritization may result in poor T2DM management.

Limited Social Support. A randomized control trial of 248 Latinos with T2DM, found that compared to men, women were less likely to receive support (p=.007), faced more barriers (p=.001), had less self-efficacy (p=.041), and were less likely to report adherence (<.001) (Mansyur, C., Rustveld, L., Nash, S. & Weiss, M., 2015). Several qualitative studies identified a mixed effect of social support, where lack of family support was a possible barrier for women trying to manage T2DM (Carbone et al., 2007; Hu et al., 2014; Kaltman, 2015).

Work Demands. Work is a necessary component of our daily lives. Gordon and Schnall (2009) go on to state that work is key to one's fundamental survival and health, it is connected to an individual's over-arching social identity, prosperity, security and welfare. Therefore, components such as, work life balance, equitable pay, and safe working environments are imperative to one's well-being and overall health.

According to the United States Department of Labor (2016), Latinas represent nearly half of the female labor force in the United States. In 2015, the labor participation rate amongst Latinas was 55.7%, with 33% employed in service occupations as compared to 11% of white non-Hispanic women. In fact, Latinas are the lowest earning demographic in the U.S., earning $26,095 less per year than white non-Hispanic men (U.S. Department of Labor, 2016). In 1963, white non-Hispanic women made 59 cents for every dollar white non-Hispanic men earned; today Latinas makes 54 cents (Platt, Prins, Bates & Keyes, 2015). According to Platt, Prins, Bates & Keyes (2015) the effects of structural gender discrimination in the work force may explain the mental health disparities among women. Furthermore, the effort-reward imbalance (ERI) model claims that failed reciprocity in terms of high efforts spent and low rewards received are likely to illicit recurrent negative emotions and sustained stress responses in exposed people. Conversely, positive emotions evoked by appropriate social rewards promote well-being, health and survival (Engels, Weyers & Vervoorts, 2015). The implications of workforce discrimination in the form of inequitable pay is particularly devastating to working Latinas, considering that 30.6% of Hispanic households were headed by a single mother (U.S. Department of Labor, 2016).

It is well-known that work can negatively affect our health (Gordon & Schnall, 2009). In fact, noxious elements of work can indeed be destructive to one's mental and physical health. Overtime, the effects can lead to a wide range of harmful and chronic diseases, such a diabetes (Gordon & Schnall, 2009). Job strain is a psychosocial consequence of prolonged work stress (Maslach, Schaufeli, & Leiter, 2001). Chronic stress is associated with accelerate biologic aging, in fact several studies have also confirmed its adverse immunological and inflammatory effects (Abola et al., 2012). Although, T2DM is considered an age related disease, Hispanics/Latinos

tend to be diagnosed with T2DM at a younger age than non-Hispanic whites (NIH, 2014).

Stratified analyses from Nyberg and colleagues (2014) found that there was an association

between job strain and an increased risk of diabetes among white-Europeans with both healthy

and unhealthy lifestyle habits. According to the American Psychological Association (2016),

Latinos have the highest reported stress across four major sources of stress including money,

employment, family responsibilities and health concerns. Considering, the earlier age of disease

diagnosis, the high costs of diabetes healthcare maintenance, and workforce discrimination in the

form of inequitable pay these results are not surprising. In fact, a recent study found that women

were 4.42 times more likely to have generalized anxiety disorder where the female wage gap was

the greatest (Platt, Prins, Bates & Keyes, 2015). Correspondingly, qualitative studies from

Chaufan, Davis, & Constantino (2011) and Cherrington et al., (2011) found that occupational

stress, poor working conditions, working multiple low-wage jobs, inflexible work hours and fear

of "rocking the boat" prevented participants from taking breaks, eating lunch, or standing up to

occupational abuses (p. 1038). One participant explained the fear of employer reprisal, "I didn't

ask for time to have lunch because I was afraid I would be fired" (p.286). Growing disparities,

such as, T2DM, stress, lack of support, workforce discrimination, fear, and inequitable pay are

marginalizing vulnerable populations leaving them susceptible to poverty and health implications

(CAP, 2015).

Attitudes Toward Physical Activity. According to National Alliance for Hispanic

Health (2010), Latinos exercise less than both non-Hispanic whites and non-Hispanic blacks. As

a result, approximately 77% of Latinos are considered overweight or obese (WIN, 2013).

Márquez and McAuley (2006) found that Latinas spent less time exercising or engaged in some

form of physical activity as compared to Latino men. Comparably, Hubert, Snider, and Winkleby

(2005) and Slattery et al. (2006), found that Latina-Americans when compared to other American women, are less likely to participate in physical activity. Similarly, D'Alonzo (2012) found that Latinas may have a higher tendency to neglect their own health management needs, particularly with health promotion practices like exercise. Additionally, D'Alonzo (2012) found that they were especially less likely to engage in, rigorous formal physical activity and/or planned vigorous exercise. A separate study from D'Alonzo and Fischetti (2008) explained that this may be due to some Latinas, specifically less acculturated Latinas, feeling that most formal types of physical activity (i.e. sports), do not have or display qualities associated with traditional feminine women. In a survey among 770 Latinos from across the United States, 30% identified physically activity as a key diabetes management practice and only 6% reported maintaining a healthy weight as necessary for diabetes management (HCHS/SOL, 2013; NAHH, 2013). The NAHH (2010) survey found that only 1% of their participants identified an inactive lifestyle as a risk factor for diabetes. This is especially telling of the current disconnect Latinos have with their healthcare and healthcare knowledge. It is particularly dangerous considering diabetes is a self-managed disease, making it especially important and vital that individuals are properly educated and monitored by their healthcare provider to achieve proper disease management and attain positive health outcomes. Correspondingly, the NAHH (2010) calls for healthcare providers to recognize that Hispanic/Latinos require additional coaching with identifying their diabetes risk factors and the health maintenance practices necessary to help prevent diabetes. NAHH (2010), goes on to say there needs to be more direct assistance to help Latinos navigate their health and the healthcare system.

Health Risk Factors (Behavioral/Physiological)

Obesity. Within the United States, obesity and T2DM are considered twin epidemics and have become widespread among the Hispanic/Latino population (ADA, 2013; Cowie et al., 2006; Kirk et al., 2008; Link & McKinlay, 2009; Otiniano et al., 2012; Markides et al, 1997; Wendel et al., 2006; Zhang, Wang, & Huang, 2009). Various studies' BMI characteristics affirm those reported by Beard et al. (2009), whereby the older Hispanic/Latino population has experienced a significant increase in obesity from 1994-2005 (Beard et al., 2009; Benoit et al., 2005; Garcia De Alba et al., 2006; Kaushik et al., 2007; Kollannoor-Samuel et al., 2011a; Kollannoor-Samuel et al., 2011b; Lasater et al., 2001; Lerman et al., 2004; Otiniano et al., 2012; Otiniano et al., 2003). However, only one study from Otiniano et al. (2012) demonstrated an association between obesity and poor glycemic control. Furthermore, the descriptive cross-sectional study conducted by Garcia De Alba et al. (2006) found that not following a special diet was linked to poor glycemic control.

Depression. Three studies described depression as an associated risk factor to uncontrolled diabetes (Garcia de Alba et al, 2006; Lerman et al, 2004; Kollannoor-Samuel et al., 2011b). Garcia De Alba et al (2006) found that depression increased the risk for poor glycemic control. Although, it was indirectly correlated with glycemic control because depression was affecting self-management variables. The findings are congruent with the study conducted by Lerman et al. (2004), which found a significant association between depression and poor treatment adherence, indicated by an indirect effect on overall glycemic control. However, Kollannoor-Samuel et al. (2011b) found that social support protects individuals with poor glycemic control from developing elevated depression. Using multivariate analyses, another study by Kollannoor-Samuel et al. (2011a) determined that depression symptoms were not

significantly correlated with poor glycemic control. According to Howarter and Bennett (2013),
"negative emotions are predicted to have a deleterious effect on health outcomes directly and
indirectly via behavioral risk factors and chronic physiological arousal" (p. 63).

Disease Duration. An overarching finding among 10 studies was the association of
disease duration with poor glycemic control. Six of 10 studies found that those participants with
prolonged disease duration had higher hemoglobin A1c (HbA1c) levels (Benoit et al., 2005;
Garcia De Alba et al., 2006; Lerman et al., 2004; Kaushik et al., 2007; Kollannoor-Samuel et al.,
2011; Otiniano et al., 2012). The disease duration in selected studies ranged between greater than
7 years and greater than 15 (Benoit et al., 2005; Otiniano et al., 2012). Benoit et al. (2005)
determined that there was a 15.3% increase in HbA1c values when disease duration exceeded 10
years. The increased duration of diabetes can make glycemic control more difficult because of
the increased pharmacotherapy and insulin resistance that sometimes accompanies aging
(Otiniano et al., 2012). Benoit et al. (2005) and Kollannoor-Samuel et al. (2011a) found that
multiple medications were correlated to poor glycemic control. Whereas, others determined that
there was a significant association between insulin use and increased HbA1c levels (Benoit et al.,
2005; Garcia De Alba et al., 2006; Lasater et al., 2001). More specifically, the study conducted
by Benoit et al. (2005) determined that there was a 22.4% increase in HbA1c in participants who
required insulin.

Frequent Healthcare Provider Visits. Interestingly, the study by Benoit et al. (2005)
found that there was a 7.9% increase in mean hemoglobin A1c (HbA1c) values among
participants who visited their healthcare-provider more than 15 times a year. Others found that
frequent visits to healthcare providers were factors associated with diabetes-related
complications (Kaushik et al., 2007). Garcia De Alba (2006) and Otiniano (2012) both found that

multiple and/or daily glucometer use is associated with poor glycemic control. Whereas Kollannoor-Samuel et al (2011a) did not find a significant association between daily glucometer use and glycemic control. Regardless, this is concerning because it may mean that these individuals are experiencing aggravated symptomology due to uncontrolled diabetes. Therefore, they are constantly checking their blood sugar or visiting their provider, in an effort to control their blood sugar.

Macro-complications. The National Alliance for Hispanic Health (NAHH) reported that the Hispanic/Latinos population, have a higher incident of diabetes related complications due to uncontrolled or undermanaged diabetes (NAHH, 2010). Consequently, this has led to an increase in diabetes-related amputations among Latinos (NAHH, 2010). Additional studies have found that macro-complications have been significantly correlated with high HbA1c values (Kaushik et al., 2007; Otiniano et al., 2012). This is of great significance as diabetes related complications have increased the death rate by 45% within this population (Otiniano et al., 2003). Findings from the H-EPESE cohort study conducted by Beard et al. (2009) showed that diabetes-related complications have remained the same since 1994, with no evidence of improvement. In fact, the prevalence of diabetes has nearly doubled, and lower-extremity function disability has increased as well (Beard et al., 2009). According to Otiniano et al. (2003) diabetes-related kidney complications nearly doubled mortality risk as compared to those without diabetes-related complications. But, the leading cause of death among older Hispanic women with diabetes is myocardial infarctions (Otiniano et al., 2003). These findings are similar to other studies conducted among women that found the risk for fatal myocardial infarctions is 50% higher in women with diabetes (CDC, 2013; Hu et al., 2001; Huxley, Brazi, & Woodward, 2006). Both studies conducted by Benoit et al. (2005) and Kollannoor-Samuel et al. (2011a) found high

cholesterol to be a risk factor for poor glycemic control. In fact, one study found that for every

0.65 increase in cholesterol values the HbA1c would increase by 2.6% (Benoit et al., 2005).

Gaps in the Literature

Based on the review of published studies, there are currently no identified studies that

explore the effects of occupational stress and familial stress on diabetes management among

aging, working Latinas with T2DM. Several qualitative studies described themes regarding

multiple role demands among Latinos with diabetes. No literature on work and T2DM

management among Latinas were specifically identified. However, themes of work as a barrier

to adherence did arise within the literature. Regardless, research and the healthcare system as a

whole must recognize that the demographic landscape of the United States is changing. In 2016,

Hispanic/Latinos represented 18% (58 million) of the U.S. population (Flores, 2017). Considered

the largest ethnic minority group within the U.S., this number will nearly double (106 million) by

2050 (CDC, 2013; U.S. Census Bureau, 2014; Cohn, 2015; Ennis, Rios-Vargas & Albert, 2011).

Therefore, research and healthcare must shift their focus to accommodate for the new

demographic landscape and all our citizens' healthcare needs. Correspondingly, the NIH (2014)

reports that knowledge of Latino health is meager and insufficient. Doty and Holmgren (2006)

explain there is a major disconnect between Latinos and the healthcare system. A 2002 cross-

sectional analysis conducted with 111 adolescent and adult, U.S. Latinos found that respondents

would only seek medical care for their diabetes, upon the onset of symptoms (52%) or with

severe symptoms/crisis (41%). That is nearly 93% only seeking treatment when symptoms were

present (NAHH, 2010). This disconnect is dangerous as evident by the prevalence of diabetic

complications that effect this population. Even though, T2DM can be managed, a lack of

culturally proficient care and understanding widens the divide between patient and provider.

Furthering healthcare disparities, increasing the burden of illness, and lowering the quality of life within this population.

Further knowledge of how cultural values such as family and gender roles are expressed can assist in developing culturally appropriate interventions (Nolle, Kuhlberg, & Zayas 2012). This knowledge will help researchers understand the modern complexities that aging, working Latina face; balancing work, family, and health demands. Ultimately, informing nursing practice and the healthcare field about the cultural and behavioral factors that influence Latino health and well-being. Lowering health disparities and closing the healthcare disconnect within this population. The purpose of this study was to understand the association between occupational stress, familial stress, and diabetes management among aging, working Latinas with Type II Diabetes Mellitus (T2DM). In order to explain and predict relationships that may lead to future studies that test culturally competent and gender specific interventions.

Chapter 3

Theoretical Framework

Reserved Capacity Model

Reserve Capacity Model (RCM) is a relatively new theoretical model that was developed by Linda Gallo at San Diego State University and Karen Matthews at the University of Pittsburgh in 2003. The origins of the model were based on principles and ideas from other resource models related to aging (Matthews, 2000; Stern, Gurland, Tatemichi, & Tang, 1994) and stress (Brown & Moran, 1997; Hobfoll, 1989, 1998, 2001; Holahan et al., 1999). According to Gallo and Matthews (2003), the main concept, *reserve capacity*, came from previous research and theoretical work that dealt with aging and resilience (see also Gallo, Matthews, Bogart, & Vranceanu, 2005).

RCM was created as a broad systemizing framework for research investigating psychosocial factors and cognitive–emotional factors in socioeconomic status (SES) driven health disparities (Gallo, 2008; Gallor, Espinosade los Monteros, & Shivpuir, 2009). The model's main premise posits that daily stressful events or experiences occur disproportionately more due to low SES factors, and in some cases, due to one's minority ethnicity. Three broad components that form the RCM framework: 1) Socio-cultural context; 2) Psycho-social risks and resilient factors; and 3) Health risks and outcomes. The s*ocio-cultural context* makes up the fibers that build one's SES and cultural context. SES factors and cultural aspects affect underlying health disparities, with those in lower-SES categories experiencing more daily demands and stressors as compared to their middle and higher-SES counterparts.

RCM proposes that low-SES and minority-ethnicity, represent factors that are associated with increased stress, which cause an individual to tap into their "*reserved capacity"* more often.

The depletion of an individuals' *reserve capacity*, affects one's ability to manage negative

emotions and events, thereby, increasing vulnerability to negative emotions, cognitions, and

events (Gallo & Matthews, 2003). These negative emotions-cognitions may then manifest as

deleterious health outcomes (Gallo & Matthews, 2003; Matthews, Gallo, Raikkonen, & Kuller,

2008).

RCM was used to inform this study on the associated impact that occupational demands

and familial demands have on glycemic control in working Latinas with Type 2 Diabetes

Mellitus (T2DM). The main hypotheses, when applying RCM, proposes that aging working

Latinas with high occupational demands and disproportionately high familial demands (as

compared to their spouse), will have a lower *reserve capacity*. As a result, threating their ability

to manage their T2DM and increasing deleterious health outcomes.
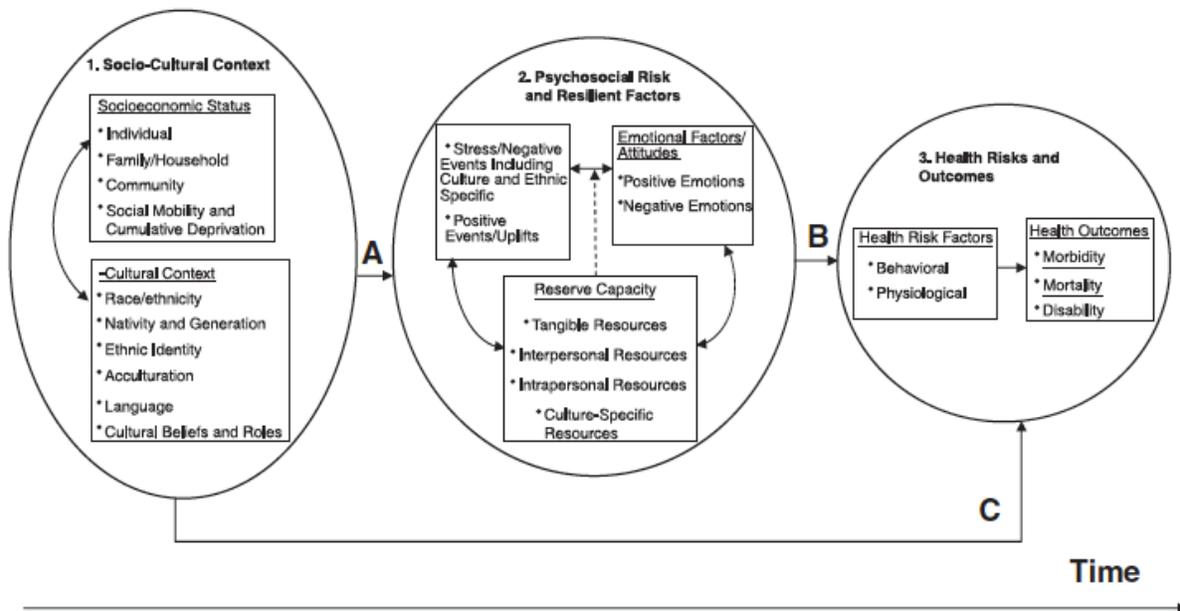
Figure 1: The Reserved Capacity Model (RCM): The RCM framework investigates psychosocial pathways in health disparities. RCM postulates that SES and cultural context (i.e. minority-ethnicity) are linked to health through associations with stress and the co-occurring negative emotions, and their subsequent connections with bio-behavioral functioning. Low SES and minority-ethnicity may predict increased emotional and physiological reactivity to stress due to a deficiency or lack of resources (i.e. "reserve capacity") and limited opportunities to refill resource reserves. Resources might represent a direct meditational pathway from socio-cultural context to health risks and outcomes (Gallo & Matthews, 2003; Gallo, 2009).

Socio-cultural Context

Gallo and colleagues (2009) acknowledged that ethnic status and social status are often confounded. Therefore, in 2009, the authors added the cultural context to the social context to create the component of socio-cultural context, taking into consideration one's race/ethnicity, nativity and generation, ethnic identity, acculturation, language, and cultural beliefs and roles (Howarter & Bennett, 2013). This opens up theoretical possibilities for using the model to guide research with Latinas. With regard to the study, we mainly focused on ethnicity, ethnic identity, and cultural beliefs and roles. The aim is to understand the impact ethnicity, cultural or gender-related beliefs, and roles have on T2DM management among Latinas.

In the RCM, another aspect of the socio-cultural context is socio-economic status. This includes: individual status, family/household status, community, social mobility and cumulative deprivation. The study focused on individual status, family/household status, and social mobility to investigate how they affect occupational and familial demands. As Latinas are the lowest earning ethnic and gender group in the U.S. (Andersen, 2016; NPWF, 2017). With the RCM, health disparities are considered to be multi-factorial; the various factors of causation are complex. Therefore, myriad factors within the socio-cultural context were investigated to help build a better understanding of the experiences of the demographic group that is the target of interest in this study.

The RCM authors hold that an individual's socio-cultural context plays an influential role in their psychosocial risk and resilient factors. More specifically, the socio-cultural context ultimately influences one's *reserve capacity*, which in turn affects one's health outcome (Gallo & Matthews, 2003). Simply, the RCM holds that those with low-SES already have low reserves and/or resources, therefore their *reserve capacity* is already reduced. Any additional depletion

could lead to negative emotion-cognition (SES-associated stress), which then makes them susceptible to poor health outcomes (Gallo, 2009; Gallo et al., 2005; Gallo & Matthews, 2003).

Psychosocial Risk and Resilient Factors

The second main component of the RCM is *psychosocial risk and resilient factors*. This has three segments. The first segment is Stress/Negative events and Positive uplifts. This includes ethnic and cultural specific negative or positive events (i.e. negative: ethnic discrimination, unequal gender roles, wage gap or positive: strong familial support system, multiple income home). The second segment is called "Emotional factors/attitudes," this part of the model refers to positive and/or negative emotions. Subsequently, experiencing negative events, such as, occupational discrimination elicits negative emotions and low positive emotions, which can directly and/or indirectly affect one's *reserved capacity*. Which effects the third segment identified as, "reserved capacity." Essentially, the model posits that in order to manage stressful environments, events, and/or emotions, one turn's to their bank of reserves. These reserves, are what the model calls "reserve capacity" (Gallo & Matthews, 2003), and they come in the form of various types of resources including: interpersonal resources (i.e., social support, social status), intrapersonal resources (i.e., control perception, self-esteem, optimism), tangible resources (i.e., income, savings, healthcare, transportation), and/or cultural specific resources (Adams, 2010; Gallo, 2009; Gallo, 2008; Gallo, Espinosa de los Monteros, & Shivpuri; 2009; Gallo & Matthews, 2003; Gallo, Penedo, Espinosa de los Monteros, & Arguelles, 2009). See Figure 1 and 2.

The three segments within the component, entitled *psychosocial risk and resilient factors,* all interact with each other to ultimately determine an individual's ability to deal with stress. The higher one's reserved capacity the more resilient they are to handle the deleterious effects of

stress. Conversely, lower reserves increase psychosocial risk and stress, consequently, fostering deleterious health outcomes. Thus, an individual's socio-cultural context has an effect on their psychosocial risk and resilient factors, and these outcomes determine one's health outcomes (Gallo, Ghaed, & Bracken, in press; Gallo & Matthews, 2003).

Health Risks and Outcomes

It is well established within epidemiological literature, that there is a link between low-SES and poor health outcome (Adler & Rehkopf, 2008; Evans, Chen, Miller & Seeman, 2012). Gallo (2009) describes how lower-SES individuals experience higher psychosocial stress, which leads to negative emotion-cognition, this link affects one's physiological health over an extended period of time stating that, "wear and tear from repeated physiological stress responses, combined with unhealthy behavioral coping strategies, take their toll, increasing vulnerability to disease and possibly accelerating the biological aging process" (p. 63). RCM theorizes that the constant degradation, depletion, and/or lack of reserve resources reciprocally contributes to stress, which then shapes one's perceptions of health through emotional and attitudinal factors, that further impact health via bio-behavioral mechanisms (Gallo, 2009). Ultimately, it is the effects of chronic stress that impact one's health outcomes. And, it is well known within epigenetics that increased stress leads to accelerated aging (Lu, 2014). The chronic exposure to stress and cortisol shortens DNA telomeres, which causes the body to release pro-inflammatory cytokines (IL-6), setting the aging process and the associated health risks into motion (Kiecolt-Glaser, Preacher, MacCalum, Atkinson, Marlarkey, & Glaser, 2003; Lu, 2014).

Conceptual Framework - Modified Reserve Capacity Model (m-RCM)

A reformulation of the *Reserved Capacity Model* was used to inform this study's investigation on the associations of occupational demands and familial demands on diabetes

management among aging, working Latinas with T2DM. The modification has reorganized the pathways to include an additional circle, called *Socio-Cultural Demands*, which is now in place of the previous circle, *Socio-Cultural Context* (figure 2). Within this study, *Socio-Cultural Demands* represents the independent variables (i.e. familial demands and occupational demands), which directly effects, through a mediated pathway, *Health Risks and Outcomes* (i.e. Dependent Variable: Diabetes Management [HbA1c]).

Socio-Cultural Context, has been moved above the main mediating pathway, it represents our moderating variables that may influence the relationship between our independent and dependent variables by increasing, decreasing, or even possibly reversing the relationship (figure 2). Essentially, *Socio-Cultural Context* (i.e. SES, minority-ethnicity, etc.) modifies the relationship between the IV (occupational demands/familial demands) and the DV (diabetes management). And, *Psycho-social Risk & Resilience Factors*, represents the mediating variables (i.e. "Reserve Capacity") that are part of the causal chain between the two variables (IV: occupational & familial demands; and DV: diabetes management [HbA1c]).

Ultimately, the m-RCM posits that one's socio-cultural context (i.e. SES, culture, ethnicity, family, etc.) moderates or changes the outcome of one's socio-cultural demands, resilient psychosocial resources (i.e. Reserve Capacity), and health risks/outcomes. However, one's socio-cultural demands have a direct effect on reserve capacity. This study hypothesizes that with increased occupational demands and familial demands, there will be a deficiency in one's reserved capacity, which will directly affect health outcomes (i.e. diabetes management [glycemic control: HbA1c]). Secondarily, if an individual has an increased familial support their ability to manage socio-cultural demands will be improved, allowing for time and resources to be allocated to health (figure 2).
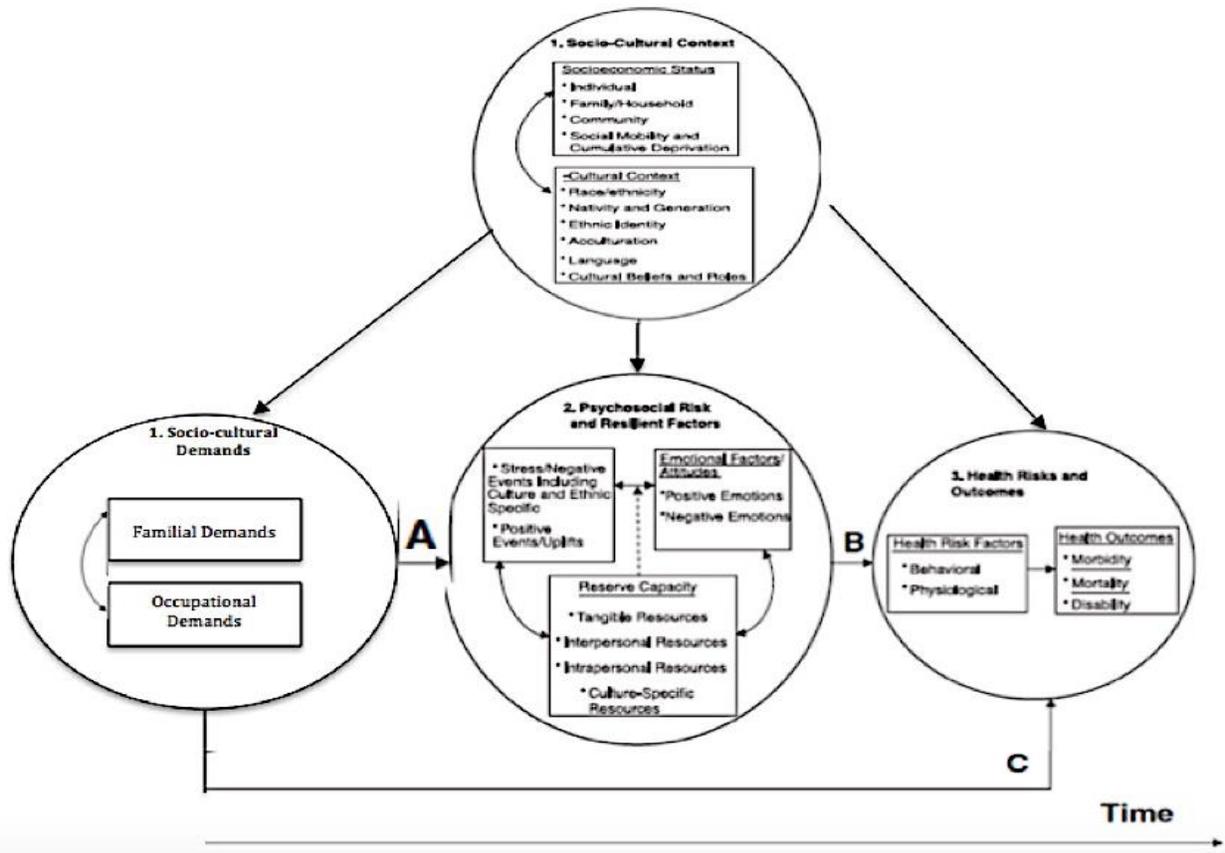
Figure 2: Conceptual Framework - Modified Reserve Capacity Model (m-RCM): The m-RCM framework continues to investigate psychosocial pathways in SES and cultural context-driven health disparities. The modified RCM posits that SES and cultural context (i.e. minority-ethnicity, culture [familism], gender) are linked to poor diabetes management through associations with demands that lead to stress and the accompanying negative emotions, and their subsequent relationship with bio-behavioral functioning. Low SES, minority-ethnicity, and gender (i.e. socio-cultural context) may increase socio-cultural demands, which may predict increased emotional and physiological reactivity to stress due to a deficiency or lack of resources (i.e. "reserve capacity") and limited opportunities to refill resource reserves. Over time, the wear and tear from repeated physiological stress responses, combined with unhealthy behavioral coping strategies, and lack of resources to allocate to diabetes management, take their toll, increasing vulnerability to poor glycemic control (McEwen, 1998; Myers & Hwang, 2004) and possibly accelerating the biological effects of poor diabetes management (Epel et al., 2006; Gallo & Matthews, 2003; Gallo, 2009).

Conclusion

The authors of the RCM claim that individuals of low-SES are already at a disadvantage when it comes to managing stressful life experiences due to the lack of tangible resources (Adams, 2010; Gallo, 2009; Gallo & Matthews, 2003), interpersonal resources, and intrapersonal resources compared to their higher-SES counterparts. They go on to explain that the reserve capacity of an ethnic minority person with low-SES may be low for two reasons. One, they are

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more often exposed to and experience stressful situations, such as, discrimination, poverty, and lack of healthcare. Therefore, they have to use what little reserve capacity they have more often. Two, their current situation and/or environment makes it more difficult to replenish and/or develop reserves that had been depleted (Adams, 2010; Gallo, 2009; Gallo, 2008; Gallo, Espinosa de los Monteros, & Shivpuri; 2009; Gallo & Matthews, 2003; Gallo, Penedo, Espinosa de los Monteros, & Arguelles, 2009). Consequently, the lack of reserve capacity (resource bank) makes these individuals more susceptible to negative emotion-cognitions. This means that living with daily threats and/or stressors is likely to lead to poor health outcomes, like, anxiety, depression, obesity, cardiovascular disease, and T2DM (Gallo, 2009; Gallo, 2008; Gallo, Bogart, & Vranceanu, 2005; Gallo, Espinosa de los Monteros, & Shivpuri; 2009; Gallo & Matthews, 2003; Gallo, Penedo, Espinosa de los Monteros, & Arguelles, 2009; Gallo et al, 2005). For this reason the RCM was used to frame the research to explore the associated effects of increased occupational and familial demands on diabetes management among aging working Latinas with T2DM. Thus, the hypothesis applied within this study as framed by the RCM, proposed that the *reserve capacity* for this specific population would be low, thereby, negatively affecting and threatening their ability to manage their T2DM (HbA1c $\geq$7.0%). Secondarily, individuals with low familial support will have a decreased ability to manage socio-cultural demands, therefore, not allowing for time and resources to be allocated to their health and T2DM management.

Methodology

In this study, we used a cross-sectional, correlational study design to investigate the associations between job and familial stress and diabetes management among aging working Latinas with T2DM. This chapter serves to describe the methodology that was used to complete the study with a description of the design/aim, target population, recruitment plan, data collection, questions/hypotheses, instrumentation, statistical analysis, participants, strengths and weaknesses/limitations.

Design & Aim

This was a cross-sectional, correlational study with convenience and snowball sampling. Fifty-seven working Latinas, 21-years and older with T2DM were enrolled. There were 50 participants who provided HbA1c levels. The aim of the study was to explore the relationships between occupational and familial stress and T2DM management in aging, working Latinas. The research goal was to describe relationships in order to guide future culturally competent intervention. The original research protocol for recruitment, enrollment and data collection changed with the COVID-19 ramp down of in-person research. At that time, in-person data had been collected by the PI from 10 research participants. Therefore, from this point onward the pre-COVID group of participants was identified either as the "in-person" group or "group 1". Data that was collected from participants online due to COVID-19 research restrictions, is referred to as the "self-reporting" group or "group 2."

Study Population

The study's target population was employed women of Hispanic/Latina descent with T2DM. Originally, the targeted age range was women >40 years. However, the age range was

expanded to include women >21 years in order to enhance recruitment, due to COVID-19 delays and changes.

The inclusion criteria led to the recruitment of employed women with T2DM, aged $\geq$21, who are English and/or Spanish speaking and who self-identify as being of Hispanic/Latina descent regardless of race or nativity. Other exclusion criteria included women with Type 1 Diabetes and women with gestational diabetes. Additional inclusion criteria for group 2 (self-reporting), required participants to have access to a computer, laptop, or smart phone in order to complete the digital on-line platform *(SurveyMonkey),* which contained the study's questionnaire.

Recruitment Plan

Due to the COVID-19 pandemic, on March 17, 2020, UCLA's Vice Chancellor for Research, Dr. Wakimoto issued a system wide policy that outlined research restrictions. Due to our population being high-risk, all in-person research procedures and activities were suspended. Therefore, this exploratory study had two recruitment plans. Group 1 includes the Latinas recruited in-person whose data was also collected by the PI in person (prior to the pandemic restrictions). Group 2 represents the participants who were recruited and completed the study online without any in person contact with the PI; all measures were self-reported by participants in this group.

In-person (Group 1)

The in-person participants (group 1) were recruited from partnered community centers and health clinics throughout a major metropolitan city within Southern California. Working in conjunction with our partnered community management company's housing and residence

director, as well as, their community center director and staff – a private room was provided at the various community centers, which provided a safe and familiar setting for our participants.

Working jointly and collaboratively with the directors and other ancillary team members, the partnered community management team was fully informed and trained about the research process and protocol. Together we distributed flyers to every resident mailbox or front door throughout the various partnered communities throughout Southern California. We also displayed flyers and posters in community recreation areas, made announcements at community events and programs, and displayed a digital flyer on the resident's community portals. Additionally, when a research team member was unavailable or not at the community center, front office staff were informed and trained to share and/or offer a flyer to every resident that came into the front office. There were also IRB approved sign-up sheets so interested residents could sign-up to signal that the PI and/or RA should contact them with additional information. The flyer had basic research information and the research team's contact information.

An additional IRB approved bilingual research assistant (Spanish and English speaking) was trained on the research protocol and participant consent form protocol. The PI had designated hours/days at the various locations for drop-in recruitment. Most recruitment occurred with a prospective participant scheduling a time with the research team. All phone scheduling included a brief phone screening to ensure the prospective patient met inclusion criteria. During the scheduled appointment time, the front desk attendant escorted the prospective participant to the private designated room and introduced the PI and the research assistant. In a private room with the prospective participant, the participant was asked their language of preference and confirmed inclusion criteria (screening protocol). Once they were screened and selected their language of preference, they would be formally informed about the study's purpose and protocol.

The participants would not be pressured to participate in the study. If more time was needed to decide, the PI's contact information and a copy of the study's information/details were provided for a future time that worked better for the prospective participant. In an attempt to help stem inadvertent coercion of the prospective participants, we would remind the prospective participants that should they choose to pull out of the study they could, no questions asked.

If the prospective participant gave verbal confirmation of interested in participating in the study, then the researcher moved into phase 2, which would be to explain in detail the study, procedures, answer any additional questions, and receive formal signed consent to participate. Part of the consent process included receiving permission to collect clinical measures, which consisted of: diabetes diagnosis date, smoking status, height, weight (BMI), waist circumference and HbA1c.

Once consent was received, we moved to phase 3, where the participants completed via paper and pencil, the questionnaire packet. Both English and Spanish versions of the questionnaire packet were available, and participants were given the option of selecting their language of preference. Also, to help those with lower literacy levels or visual impairment participate in the study in a fair and equitable manner, we also asked the participant if they would like assistance with reading their questionnaire. If the participant required assistance with their Spanish version questionnaire, a bilingual IRB approved research assistant was provided.

Once the questionnaire was completed, the PI checked to see if any questions were skipped and she answered any questions the participant may have had regarding the questionnaire. Next, all clinical measures were collected by the PI in this sequence: diabetes diagnosis date, smoking status, height, weight, waist circumference and HbA1c. All data and/or

personal information was kept confidential. Each participant received an alphanumerical code to be used with study data.

The point of care HbA1c test was performed on 1.5ul (microliter) of fingerstick blood entered directly into the FDA approved *Afinion Analyzer*. Results were read in three minutes on a screen display. The data would be recorded on a data sheet that has the participants alphanumerical code only. There was no way to save any of the blood used for the test and all biohazard material was disposed of in an approved secured biohazard red bin. After all data was collected, *American Diabetes Association* resources and take-home education material in the language of preference would be provided. These resources included:

- Diabetes: Your Take Control Guide (American Diabetes Association)

- What is Diabetes? Brochure (American Diabetes Association)

- Your Job and Your Rights Brochure (American Diabetes Association)

- How to get help with Diabetes Discrimination (American Diabetes Association)

If needed, diabetes program referral sites, free health clinic sites, and free / low-cost mental health clinics would be provided, upon participant request. In addition, the participants would receive T2DM education from a registered nurse. All participants received $40.00 for participating in the study.

Self-Reporting (Group 2)

The self-reporting participants (group 2) were recruited using flyers displayed at various partnered community centers and health clinics throughout a major metropolitan city in Southern California. Flyers were also distributed to every resident through the digital portal and communication system of our partnered community management company - as well as flyers displayed on the internet and social media platforms. Prospective participants called the

information line on the recruitment flyer. The PI encouraged prospective participants to share the study's details (via digital distributed fliers) with family and friends.

Persons interested in participating contacted the PI by phone for screening. If the participant's language of preference was Spanish, the PI connected the participant to the bilingual RA. All group 2 participants were screened over the phone. If the participant met all inclusion criteria as outlined by the screening script, a valid email was collected, and the digital survey was delivered via *SurveyMonkey's* link. In the privacy of their homes and at their leisure, the participants completed the self-reported digital survey. When they opened the *SurveyMonkey* link, they could review the *Research Consent Form.* Before proceeding to the actual survey, they were asked a *Research Consent Form* question: "Do you agree to the above terms?" Once they clicked "Yes - I agree to participate", consent was received, and they proceeded to the self-reported survey. The digital online consent form and questionnaire packet was available in English and Spanish. All procedures were conducted online via *SurveyMonkey*, which included a digital consent and the survey packet.

The clinical measures were no longer collected in-person by the PI. Therefore, all participants self-reported their clinical measures. Instructions on how to appropriately measure waist circumference was provided via the *SurveyMonkey* platform. The most recent HbA1c within the past 6-months were self-reported by the participants. Once the participant completed the self-reported survey, the PI got notification from *SurveyMonkey*. This prompted the PI to send the participant their digital copy of the *Research Consent Form*, their T2DM education packet and $40.00 Target® gift card via email. A formal phone line was created to be available to participants, should they have any questions. This phone line was serviced by the PI and RA.

With both recruitment plans, the prospective participant was given a copy of the consent to participate and researcher contact information should they have had any additional questions and/or concerns. We also explained that they had the right to receive the results of the study, should they choose. If they chose to have the results of the study, their alphanumeric identifier was taken down and once the results are tabulated they will receive a copy in the mail. No participants made this request.

Data Collection

All the questionnaires were completed by pencil and paper for in-person group 1. And, for self-reporting group 2, all data was collected digitally via *SurveyMonkey*. No names or patient identifiers were used, every participant had an alphanumeric number designated to them.

Demographic data included: Age, gender, race/ethnicity, nativity, marital status, and number of household members (providing age & relationship of each household member). Other descriptive data included: Year of diabetes diagnosis and 12-item diabetes self-care activities (e.g. On how many of the last seven days did you test your blood sugar?; On how many of the last seven days did you check your feet?; Have you smoked a cigarette - even one puff - during the past seven days?; "On how many of the last seven days did you eat five or more servings of fruits and vegetables?"). Tangible Financial Resources included: employment status, education attainment, total household income, health insurance status, and transportation.

Table 1: Instrumentation

Variables	Collection	Translated in Spanish	Validated with Hispanic/Latinos	# of Items
Demographic Questions: Age, Gender, Year of Diabetes dx	PI collected	n/a	n/a	n/a
Additional Demo Questions: race/ethnicity, nativity, tangible resources, etc.	Pencil/Paper Questionnaire	n/a	n/a	n/a
Descriptive Questions: Diabetes Self-Care Activities	Pencil/Paper Questionnaire	Yes	Yes	12
Waist Circumference	PI collected	n/a	n/a	n/a
Height/Weight (BMI)	PI collected	n/a	n/a	n/a
HbA1c	PI collected	n/a	n/a	n/a
Job Content Questionnaire & JCQ-Psychology / JCQ-Physical	Pencil/Paper Questionnaire	Yes	Yes	37
Assessment of Occupational Physical Activity	Pencil/Paper Questionnaire	No	No	1
Home Demands Scale (HDS)	Pencil/Paper Questionnaire	No	No	10
Control at Home	Pencil/Paper Questionnaire	No	No	1
Family Support Inventory for Workers (FSIW)	Pencil/Paper Questionnaire	No	No	44
General Health Questionnaire (GHQ-12)	Pencil/Paper Questionnaire	Yes	Yes	12
Total # of Items	---	---	---	117

Instrumentation

The main variables of interest (familial stress, occupational stress, and HbA1c), the

modified-Reserved Capacity Model and previous research studies guided the selection of

instrumentation used for this cross-sectional correlational study. There were five main

independent variables being explored [job strain, home demands, control at home, perceived

familial support, and distress].

Socio-cultural Demands

Familial Demands

Home Demand-Control Scale (Unpaid work). Several studies utilized the Home Demands scale, which was created by Peeters, Montgomery, Bakker & Schaufeli (2005),that mirrors Karasek's Demand-Control Scale. The 10-item home demands scale contains three main subscales: Quantitative Home Demands scale ("Do you find that you are busy at home?" "Do you have to do many things in a hurry when you are at home?" and "Do you have to carry out a lot of tasks at home [household/caring tasks]?"); Emotional Home Demands scale ("How often do emotional issues arise at home?"; "How often does your housework confront you with things that touch you personally?" and "How often do you get frustrated about things concerning your home-life?"), and the Mental Home Demands scale ("Do you find that you have to plan and organize a lot of things in relation to your home life?" "Do you have to remember a lot of things with regard to your home life?" "Do you have to do many things simultaneously at home?" and "Do you have to coordinate everything carefully at home?") (Peeters, Montgomery, Bakker, & Schaufeli, 2005). There are 11-items, with higher scores indicating higher home demands (scale range: 1=never, 2=rarely, 3=sometimes, 4=often, 5=always). Control at Home scale is a single item ordinal Likert scale response, with a higher score meaning higher control at home (scale range: 1=strongly disagree, 2=moderately disagree, 3=slightly disagree, 4=slightly agree, 5=moderately agree, 6=strongly agree).

The Home Demands scale was used with 1,264 working Danish women and men between the ages of 20-69, 42% having children living at home. The tool's reliability was good with this specific population, the internal consistencies (Cronbach's α) were identified as follows: Quantitative Home Demands scale (0.80); Emotional Home Demands scale (0.76); and

the Mental Home Demands scale (0.80). This tool has not been tested in Spanish or with Hispanic/Latino populations (Peeters, Montgomery, Bakker, & Schaufeli, 2005).

Occupational Demands

Job Content Questionnaire (JCQ). Occupational demands were measured using the JCQ, which is a tool to assess psychosocial job demands (Karasek et al., 1998; Karasek et al., 2003). JCQ scores are determined by utilizing formulas to calculate participant's "high" or "low" work demands; "high" or "low" job decision latitude; and whether or not the participant is experiencing job strain. It is a validated 49-item questionnaire. There are seven main subscales within the JCQ; among English-speaking women, the reliability (Cronbach's α) for these subgroups are as follows: job skill discretion (0.75), job decision-making authority (0.68), job decision latitude (skill discretion + decision authority = 0.72), job demands (0.63), coworker support (0.77), supervisor support (0.84), and job insecurity (0.58) (Karasek et al., 1998; Araujo & Karasek, 2008). However, the shorter 27-item questionnaire was used, which utilizes a Likert-scale format, varying from 1 ('strongly disagree') to 4 ('strongly agree'). This shorter version uses four of the seven subscales [job skill discretion, job decision-making authority, job decision latitude (skill discretion + decision authority), and job demands]. It is a weighted combination of the 27 items, calculated according to instrument scoring instructions, where a score >1 would indicate job strain. Two additional subscales were added, JCQ-psychological and physical scale. The JCQ-psychological scale has an average of 5 items measured on a 5-point scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree), with higher scores indicating higher psychological job demands. JCQ-physical also has an average of 5 items measured on a 5-point scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree), with higher scores indicating higher physical job demands.

The JCQ has been translated into 23 languages, used internationally, and is perhaps the most widely used psychosocial working conditions scale (Choi et al., 2011; Hurrell et al., 1998; Lansbergis & Theorell, 2000). The JCQ has been translated in Spanish and tested with Hispanic/Latino populations (Araujo, 2004; Becerril, 1999). In a Spanish study among 330 Spanish-speaking nurses the reliability (Cronbach's alpha) was good, between 0.74 and 0.88 (Escribà-Agüir, Más-Pons, & Flores-Reus, 2001).

Family Support Inventory for Workers (FSIW). The FSIW is a validated, 44-item family support questionnaire, consisting of statements that describe family specific experiences, to which participants report on a 5-point Likert scale (strongly agree to strongly disagree). The FSIW tool is broken up into two subscales: Emotional Sustenance (29-items) and Instrumental Assistance (15-items). Questions vary from "My family burdens me with things that they should handle on their own."; "Members of the family cooperate with me to get things done around the house."; "My family members do their fair share of the household work."; "Someone in my family asks me regularly about my workday."). Higher FSIW scores mean higher family support for workers (scale range 1-5). FSIW was tested and validated with English-speaking, employed men and women. The readability was tested at an 8th grade level and reliability reported high internal consistency. The coefficient alpha values for Emotional Sustenance ($\alpha = 0.97$) and Instrumental Assistance ($\alpha = 0.93$) and measured a common construct (King, Mattimore, King, Adams, 1995). There were no studies identified that tested and/or validated the FSIW tool among Spanish-speaking Latina women. In an effort to create an adapted Spanish-version of the FSIW, this study utilized the services of a professional translation company (Rev), which translated the English version of the FSIW to Spanish. Then three bilingual (Spanish/English) women back translated the adapted Spanish FSIW version to English.

General Health Questionnaire (GHQ-12). GHQ is a 12-item self-reported psychometric screening questionnaire that has been translated and validated with Spanish-Latino populations (Araya, Wynn, & Lewis, 1992; Katerndahl, Amodei, Larme, & Palmer, 2002; Lobo, Perez-Echeverria, & Artal, 1986; Mari & Williams, 1985). In a previous study with Spanish women, the calculated Cronbach's alphas ($\alpha = .76$) demonstrated adequate internal consistency (Pilar Sanchez-Lopez & Dresch, 2008). The GHQ-12 uses a 4-point Likert scale, with every point having a numerical weight ranging from 0-3. A score greater than 20 suggests severe problems and psychological distress.

Statistical Analysis

Statistical analysis was performed with IBM SPSS version 22.0. Descriptive statistics were used to summarize the variables. Selected variables were reported as summary statistics using percentages, means, standard deviations, minimum, and maximums. Cronbach's alpha was used to evaluate internal consistency reliabilities for the various measures.

For evaluating associations with HbA1c levels and glycemic control, 17 variables were considered, representing the four domains of the hypotheses plus clinical and additional employment-related variables as suggested by the theoretical model and measured by the study. The Home Strain domain was represented by *Home Demands* and *Control at Home*. The Job Strain domain was represented by the *Job Content Questionnaire (JCQ-27), JCQ-Psychological and Physical* subscales, and the *Assessment of Occupation Physical Activity (AOPA)* scale; Additional employment-related variables included in analyses were income, number of years with title, hours worked, and standard occupation. The Family Support domain was represented by the *Family Support Inventory for Workers (FSIW)* scale. The Distress domain was represented by the *General Health Questionnaire (GHQ-12)* scale. Clinical variables included weight (lbs.),

waist circumference (inches), BMI (lb./in2), weight to height ratio, and number of years diagnosed with T2DM. Age, education, and type of data collection (in-person vs. self-report) were also considered as possible sociodemographic or research process covariates for testing the hypotheses. Due to the small sample size, comprehensive models with all variables and covariates were not estimated; the process of selection of variables for parsimonious models is described below. Initial choice of employment, clinical, and sociodemographic variables to be considered in analyses was based on the theoretical model or suggested by the literature.

Most of these variables were considered in their continuous form (see Appendix C and D for descriptive statistics). Variables considered in ordinal form included the AOPA (1-5 Likert scale), control at home (1-6 Likert scale), number of years with title (values 1-5 corresponding to ordinal categories [see Table 2]), education (values 1-7 corresponding to ordinal categories [see Table 2], and income (values 1-7 corresponding to ordinal categories [see Table 2]). Ordinal variables were treated as continuous rather than categorical in the linear and logistic regression analyses because small cell frequencies hindered estimation. Standard occupation was collapsed to lower vs higher level (0=lower-status, lower-paying (LL); 1=higher-status, higher-paying (HH)). Women with lower-status, lower-paying jobs were considered participants that were in positions that earned less than two-thirds of the national median, which is 45,802 (U.S. Bureau of Labor Statistics, 2019). And were in positions such as: healthcare support, food preparation & service, building & grounds cleaning, personal care & service, sales & related occupations, office & administration support, production & assembly, and transportation & materials moving. HbA1c control was binary coded as: 0=controlled and 1=not controlled. Type of data collection was binary coded as: 0=self-report, 1=in-person/PI.

Prior to hypothesis testing with the dichotomous indicator of glycemic control, preliminary analyses examined simple associations of the variables listed above with the continuous measure of HbA1c. Simple linear regression models were estimated with one predictor at a time for each of the 17 variables listed above (not including possible sociodemographic covariates). Supplemental exploration of multivariable linear regression models of HbA1c levels appear in Appendix B; but since they did not directly test the stated hypotheses, results are not presented in Chapter 5.

Logistic regression was used to test each of the four hypotheses, with glycemic control (HbA1c) as the dependent variable (0=control, 1=not controlled). Analyses were planned to include in each multivariable model the relevant domain measures, as well as selected clinical and sociodemographic covariates as described above. Because of the small sample, several strategies were incorporated to keep models as parsimonious as possible; these included the following: 1) BMI was selected as a proxy for the subset of highly intercorrelated clinical variables because it was the most strongly correlated with glycemic control; 2) standard occupation was dropped because it was highly correlated with income and other employment variables; 3) bivariate correlations were examined for clinical (BMI), sociodemographic (age, education, income), and research strategy (type of data collection) covariates with glycemic control with the intention of retaining in the models only those covariates related at $p<.20$. As a result of these strategies, BMI, age, education, income, and type of data collection were not included in any of the models as covariates because of their weak correlation with glycemic control. Thus, models for testing hypotheses 1 and 3 included only the relevant domain variables: home demands and control at home for hypothesis 1 and family support for hypothesis 3. The model for testing hypothesis 2 included the four primary domain variables (job strain, JCQ

psychological and physical subscales, AOPA) and two employment variables (hours worked per week and years with job title). The model for testing the association of distress in Hypothesis 4 controlled for home strain, job strain, and family support because their impact on distress was suggested by the theoretical model. To keep this Hypothesis 4 model at a manageable parsimonious level, the JCQ-27 score was used to represent the domain.

Sample Size

An initial power analysis was conducted and indicated that a minimum of 60 and maximum of 100 participants would be needed in order to test all the hypotheses. The power analysis indicated that a sample size of 60 subjects would allow detection of a medium effect size (odds-ratio of 2.5) and 10% variance explained by the predictors. An additional power analysis for a logistic regression was conducted and G*Power 3.1.7 (Faul, Erdfelder, Buchner, & Lang, 2013) used to determine a sufficient sample size using an alpha of 0.05, a power of 0.80, a small-medium effect size (odds ratio = 1.92), with 20% variance explained by the predictors and two-tailed test. Therefore, in order to achieve a small-medium effect size we needed to recruit 60-100 participants. Non-responses were excluded from the data.

Due to COVID-19, time, and resources, the sample size was reevaluated for detection of a slightly larger effect size. A sample of 50 subjects with usable data would be needed in order to test all the hypotheses with a medium-to-large effect size. The power analysis indicated that a sample size of 50 subjects would allow detection of a medium-large effect size (d=.72) for linear regression coefficient. An additional power analysis for a logistic regression was conducted and G*Power 3.1.7 (Faul, Erdfelder, Buchner, & Lang, 2013). It was determined that a logistic regression odds ratios with a sample of 50 participants would have a detection of between 3-5, which translates into medium-large effect size of between d=.6 and d=.9. The final sample size

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was 57 (n=57), however usable data was available for 50 participants (n=50) which met the revised criterion. Our hypotheses did not change but we recognized that the smaller sample of 50 participants would not provide the power to detect small effect size relationships. Our study would, however, allow exploration of effect sizes to form a basis for future work, as well as function as an exploratory study to examine instrument reliability and feasibility of research procedures in this important population.

Chapter 5

Results

The primary aim of this research study was to explore the association between occupational and familial stress and diabetes management among our sample of working Latinas with T2DM. The secondary aim was to understand if family/friend support was associated with glycemic control among our sample of aging, working Latinas with T2DM.

Question 1: Is there an association between the demands of unpaid home/familial responsibilities and HbA1c?

Hypothesis 1: Higher scores on the *Home Demands* and *Control at Home* scale (home strain) will be associated with an HbA1c greater than 7.0%.

Question 2: Is there an association between the demands of paid work and HbA1c?

Hypothesis 2: Higher scores on the *Job Content Questionnaire* (>1.0; job strain) will be associated with an HbA1c greater than 7.0%.

Question 3: Is there any association between family support for paid workers and HbA1c?

Hypothesis 3: Lower *Family Support Inventory for Workers* scores will be associated with an HbA1c greater than 7.0%.

Question 4: Is there an association between distress and HbA1c?

Hypothesis 4: Severe distress scores will be associated with an HbA1c greater than 7%.

Study Population Characteristics

As noted, the study population included 57 participants. Age ranged from 21 years to 69 years, mean 40.2 (SD = 9.79), with 51.1% over 40 years. Over half of the women reported being married or in a domestic / civil union (64.9%) and most of the participants had completed some college, attained technical degree / certificate or an associate degree (61.4%). With regard to

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country of origin, descent and/or heritage, the majority were of Mexican ethnicity (77.2%), followed by Guatemalan (7.0%), Puerto Rican (5.3%), El Salvadorian (3.5%), Venezuelan (3.5%), Dominican (1.8%) and Cuban (1.8%). Approximately 65% selected English as their language of preference (n=37), with an additional 11 participants (19.3%) selecting no preference, as they were equally fluent in Spanish and English. (Table I)

Table 1: Basic demographic characteristics of the study population (N=57).

MEASURES	%	*n*	Mean	SD	Min-Max
Age	100	57	40.18	9.79	22-63
21-29	12.3	7	-	-	-
30-39	31.6	18	-	-	-
40-49	38.6	22	-	-	-
50-59	14.0	8	-	-	-
>60	3.5	2	-	-	-
Country of Origin / Descent	100	57	-	-	-
Mexico	77.2	44	-	-	-
Guatemala	7.0	4	-	-	-
Puerto Rico	5.3	3	-	-	-
El Salvador	3.5	2	-	-	-
Venezuela	3.5	2	-	-	-
Dominican Republic	1.8	1	-	-	-
Cuba	1.8	1	-	-	-
Language of Preference	100	57	-	-	-
English	64.9	37	-	-	-
Spanish	15.8	9	-	-	-
No preference – Fluent both	19.3	11	-	-	-
Education Level	100	57	-	-	-
8th grade or less	3.5	2	-	-	-
Some high school	1.8	1	-	-	-
High school degree / GED	12.3	7	-	-	-
Some college or technical certificate	31.6	18	-	-	-
Associates degree	29.8	17	-	-	-
Bachelor's degree	21.1	12	-	-	-

Table 1: Continue - Basic demographic characteristics of the study population (N=57).

MEASURES	%	*n*	Mean	SD	Min-Max
Marital Status	100	57	-	-	-
Married/civil union/domestic partnership	64.9	37	-	-	-
Single, but cohabitating	3.5	2	-	-	-
Single, never married	12.3	7	-	-	-
Separated/Divorced/Widowed	19.4	11	-	-	-
Health Insurance	98.2	56	-	-	-
Individual plan – you pay for the plan	19.3	11	-	-	-
Group plan – employer, union, etc.	52.6	30	-	-	-
U.S. Government Health Plan	17.7	10	-	-	-
No health insurance - last 12 months	10.4	6	-	-	-
Transportation					
Car / Someone drives me	84.2	48	-	-	-
I walk / I bike / Public transportation	45.6	26	-	-	-
Motorcycle	7.1	4	-	-	-
Tangible Resources	100	57	-	-	-
Yes	70.2	40	-	-	-
No	29.8	17	-	-	-
COVID-19 Well-being	78.94	45	2.09	1.13	0-3
Poor (value=0)	12.3	7	-	-	-
Fair (1)	8.8	5	-	-	-
Good (2)	17.5	10	-	-	-
Very good (3)	40.4	23	-	-	-
Excellent (4)	0	0	-	-	-
Missing data	21.1	12	-	-	-

[a] Tangible Resources: Do you have enough financial resources to meet your monthly needs? COVID-19 Well-being: During this time of COVID-19, how would you describe your well-being?

Employment Demographics

In terms of employment demographics, the majority of women within the sample were currently employed (n=35; 61.4%), with 12 (21.1%) having been recently furloughed or laid off due to COVID-19. Of the 57 women, 43 (75.5%) were working over 35 hours per week (Mean=39; SD: 11.75) with their full-time work minimum and maximum (Min/Max) ranging from 35 to 80 hours/week. One-eighth (12.3%) of the sample had a second or third job. The top occupation categories were Office & Administrative Support (n=17; 29.8%) and Healthcare Support (n=12; 21.1%). All participants who worked in *Building & Grounds, Cleaning & Maintenance* and *Production & Assembly* were from the in-person group. All 6 participants in the *Management* category were from the self-reporting group. Mean annual income with in-person participants was $25,000 to $34,999, with 50% having less than $25,000 per year as compared to 12.8% from self-reporting participants. The mean annual income for group 2 was $50,000 to $74,999, with 42.6% having $75,000 or more. The greater portion of the sample has had their title at their place of employment for 0 to 10 years (n=47; 82.4%), with over half (n=15; 56.1%) having it for 0-4 years. The type of work ranged from shiftwork (78.9%), nightshift (1.8%), non-regular (8.8%), mandatory overtime (0%), extended daily hours (3.5%), and weekend work (7.0%). However, the predominate type of work for those who had 2-3 jobs was weekend work (n=7; 100%). A portion of the sample (10.6%) reported having no insurance. And, over a quarter (n=17; 29.8%) reported not having enough financial resources to meet their monthly needs - more specifically, 50% of group 1 and 25.5% of group 2 (Table 2).

Table 2: Employment demographic characteristics of the study population (n=57).

MEASURES	%	*n*	Mean	SD	Min-Max
Employee Status	100	57	-	-	-
Full-time (salary)	36.8	21	-	-	-
Full-time (hourly)	36.8	21	-	-	-
Part-time	19.3	11	-	-	-
Self-employed	7.0	4	-	-	-
Household Income	100	57	-	-	-
Less than $25,000	19.3	11	-	-	-
$25,000 - $34,999	8.8	5	-	-	-
$35,000 - $49,999	10.5	6	-	-	-
$50,000 - $74,999	26.3	15	-	-	-
$75,000 - $99,999	21.1	12	-	-	-
$100,000 - $124,999	10.5	6	-	-	-
$125,000 - $149,000	3.5	2	-	-	-
Furloughed / Laid-off due to COVID-19	82.45	47	-	-	-
Yes	21.1	12	-	-	-
No	61.4	35	-	-	-
Employment Type	100	57	-	-	-
Management	10.5	6	-	-	-
Business & Financial Operations	1.8	1	-	-	-
Community & Social Services	5.3	3	-	-	-
Educational Instruction & Library	1.8	1	-	-	-
Art, Design, Entertainment & Media	1.8	1	-	-	-
Healthcare Support	21.1	12	-	-	-
Food Prep & Service related occupations	5.3	3	-	-	-
Building & Grounds, Cleaning & Maintenance	5.3	3	-	-	-
Personal Care & Service	3.5	2	-	-	-
Sales & related occupations	7.0	4	-	-	-
Office & Administrative Support	29.8	17	-	-	-
Production & Assembly	5.3	3	-	-	-
Transportation & Material Moving	1.8	1	-	-	-

[a] Employment type is based on the Standard Occupation Classification. No participants were in the following occupation categories: Computer & Mathematical; Architecture & Engineering; Life, Physical & Social Science; Legal; Healthcare Practitioners & Technical; Protective Service; Farming, Fishing & Forestry; Construction & Extraction; Installation, Maintenance & Repair; and Military Specific Occupations

Table 2: Continued – Employment demographic characteristics of the study population (n=57).

MEASURES	%	*n*	Mean	SD	Min-Max
Years with Title	100	57	7.09	6.97	1-37.25
0 – 4	56.1	32	-	-	-
5 – 10	26.3	15	-	-	-
11 – 15	5.3	3	-	-	-
16 – 20	8.8	5	-	-	-
>20	3.5	2	-	-	-
Hours Worked per Week	100	57	38.94	11.75	5.5-80
>35	19.3	11	-	-	-
35 – 40	54.4	31	-	-	-
41 – 50	21.1	12	-	-	-
51 – 60	1.8	1	-	-	-
>60	3.5	2	-	-	-
Number of Jobs	100	57	1.14	.40	1-3
1	87.7	50	-	-	-
2	10.5	6	-	-	-
3	1.8	1	-	-	-
Type of Work	100	57	-	-	-
Shiftwork	78.9	45	-	-	-
Nightshift	1.8	1	-	-	-
Non-regular	8.8	5	-	-	-
Mandatory overtime	0	0	-	-	-
Extended daily hours	3.5	2	-	-	-
Weekend	7.0	4	-	-	-

Family / Household Demographics

As for family and household demographics (Table 3), the majority of participants reported having 2-4 household members (n=41; 71.9%) with the overall mean number of household members being 3.32 (SD: 1.853, Min-Max: 0-9). Of those living with household members, 27 (47.4%) had children living in their household, and of that, 23 (40.4%) reported as having 1-4 children under the age of 13. Just under a quarter (n=12; 21.1%) of the sample reported being the primary caregiver for an adult household member and 5 (8.8%) reported as dis(alter)-abled.

Table 3: Family / Household demographic characteristics of the study population (n=57).

MEASURES	%	n	Mean	SD	Min-Max
Number of People in Household	100	57	3.32	1.85	0-9
0	1.8	1	-	-	-
1	10.5	6	-	-	-
2	26.3	15	-	-	-
3	17.5	10	-	-	-
4	28.1	16	-	-	-
5	5.3	3	-	-	-
6	3.5	2	-	-	-
7	3.5	2	-	-	-
8	0	0	-	-	-
9	3.5	2	-	-	-
$\geq$10	0	0	-	-	-
Household Children: 0 to 18	100	57	-	-	-
Yes	47.4	27	-	-	-
No	52.6	30	-	-	-
Household Children: under 13 yrs of age	100	57	.74	1.06	0-4
0	59.6	34	-	-	-
1	15.8	9	-	-	-
2	19.3	11	-	-	-
3	1.8	1	-	-	-
$\geq$4 or more	3.5	2	-	-	-
Household Older Adults: 65 & older	100	57	.14	.44	0-2
0	89.5	51	-	-	-
1	7.0	4	-	-	-
$\geq$2 or more	3.5	2	-	-	-
Household Dis(alter)-abled	100	57	.11	.36	0-2
0	91.2	52	-	-	-
1	7.0	4	-	-	-
$\geq$2 or more	1.8	1	-	-	-
Caretaker for Adults	89.47	51	-	-	-
Yes	21.1	12	-	-	-
No	78.9	45	-	-	-

Clinical Characteristics

With regard to clinical characteristics (Table 4), the mean waist circumference was 37.87 inches (SD: 9.56; Min-Max: 26-63), with 50.9% (n=29) having a waist circumference over >35 inches. The mean BMI for the sample was 31.21 (SD: 9.37; Min-Max: 17.42-54.99), with 56.2% (n=32) having above advised or *at risk* BMIs - of that 47.4% (n=27) were classified as obese. The mean number of years diagnosed with T2DM was 9.33 years (n=57; SD: 8.45; Min-Max: 0.166-38). HbA1c means for self-reported participants (n=40) was 7.64% $\pm$ 1.87% (*M*: 173mg/dL; Min-Max: 5.1-17.0%) and in-person (n=10) was 8.16% $\pm$ 2.15% (*M*: 187mg/dL; Min-Max: 5.5-11.8%). The total sample (n=50) mean HbA1c was 7.74% $\pm$ 1.92% (*M*: 175mg/dL; Min-Max: 5.1-17.0%). Seven participants were either disqualified or missing HbA1c data. Overall, 15 participants (26.3%) had their HbA1c controlled ($\leq$6.9%; $\leq$151mg/dL) and 35 (61.4%) had their HbA1c uncontrolled ($\geq$7.0%; $\geq$154mg/dL). And, 10 (17.5%) participants within the uncontrolled category were classified as having *critically high* HbA1c (>9.0%; >212mg/dL).

Over a quarter (26.3%; n=15) of participants reported that their healthcare team did not give them a healthy eating plan. Six (10.5%) participants reported eating five or more servings of fruits and vegetables every day of the week. Approximately, 35.1% (n=20) of participants reported checking their feet daily. The mean number of days participants tested their blood glucose was 5.30 days (n=56; SD: 2.54 days; Min-Max: 0-7 days) - with 8.8% reported not testing their blood glucose at all and 3.5% reporting that they only test their blood if they "don't feel well." There was a reported 46.5% medication compliance rate for all medication groups. Only 65% of participants were advised by their healthcare team to use the POC blood glucose monitoring method to test their blood. And, nearly a quarter (24.6%) of the sample reported

never having had a dilated and/or comprehensive eye examination by an ophthalmologist or optometrist at the time of diagnosis. The sample findings related to diabetes self-care activities are presented on Table 5. Exploratory difference between in-person (group 1) and self-reported (group 2) clinical measure are presented in the Appendix A and B.

Table 4: Clinical demographic characteristics of the study population (n=57).

MEASURES	%	*n*	Mean	SD	Min-Max
Waist Circumference (inches)	94.7	54	37.87	9.57	26-63
≤35	43.9	25	-	-	-
>35	50.9	29	-	-	-
BMI (lb./in²)	100	57	31.21	9.38	17.42-54.99
Underweight (<18.5)	1.8	1	-	-	-
Healthy (18.5 – 24.9)	42.1	24	-	-	-
Overweight (25.0 – 29.9) → increased risk	8.8	5	-	-	-
Obese Class I (30.0 – 34.9) → high risk	15.8	9	-	-	-
Obese Class II (35.0 – 39.9) → very high risk	12.3	7	-	-	-
Obesity Class III (≥40) → extremely high risk	19.3	11	-	-	-
At Risk BMI	94.73	54	-	-	-
Yes	56.2	32	-	-	-
No	43.9	25	-	-	-
Waist-to-Height Ratio (WHTR)	94.7	54	.59	.15	.41-.97
Appropriate – Healthy (<0.5)	40.4	23	-	-	-
High – At risk (≥0.5)	54.4	31	-	-	-
Any form of Smoking	82.45	47	-	-	-
Yes	3.5	2	-	-	-
No	78.9	45	-	-	-
Household Members that Smoke	82.45	47	-	-	-
Yes	12.3	7	-	-	-
No	70.2	40	-	-	-
Length of T2DM Diagnosis (years)	100	57	9.33	8.45	.166-38
0 – 5	47.5	27	-	-	-
6 – 10	22.8	13	-	-	-
11 – 15	8.8	5	-	-	-
16 – 20	8.8	5	-	-	-
>20	12.3	7	-	-	-
HbA1c Test Levels	87.7	50	7.74	1.92	5.1-17.0
HbA1c Levels	87.7	50	-	-	-
Controlled: <6.9%	26.3	15	-	-	-
Uncontrolled: 7.0% - 8.9%	43.9	25	-	-	-
Critically High: >9.0%	17.5	10	-	-	-

Note. At-Risk BMI: >29.9 = very high risk.

Table 5: Summary of diabetes self-care activities characteristics (n=57).

MEASURES	%	*n*	Mean	SD	Min-Max
HEALTHCARE TEAM					
Eating Plan* – *Has your healthcare team given you a healthful eating plan:	100	57	-	-	-
Yes	73.7	42	-	-	-
No	26.3	15	-	-	-
Test Method *– Which of the following has your healthcare team advised you to do:*					
Color Chart	22.8	13	-	-	-
POC Blood Glucose Monitor (machine)	68.4	39	-	-	-
Urine test	10.5	6	-	-	-
Other: Continuous Glucose Monitoring	1.8	1	-	-	-
Eye Exam *– Dilated and/or comprehensive eye exam at time of diagnosis:*	78.94	45	-	-	-
Yes	54.4	31	-	-	-
No	24.6	14	-	-	-
Missing data	21.1	12	-	-	-
T2DM SELF-CARE ACTIVITIES					
Diet last 7 days *– How many days have you followed your eating plan:*	100	57	5.21	2.43	0-8
0	3.5	2	-	-	-
1	1.8	1	-	-	-
2	3.5	2	-	-	-
3	8.8	5	-	-	-
4	15.8	9	-	-	-
5	15.8	9	-	-	-
6	8.8	5	-	-	-
7	24.6	14	-	-	-
I don't have an eating plan	17.5	10	-	-	-
Diet last 7 days *– How many days did you eat five or more servings of fruits & vegetables:*	100	57	3.98	1.67	0-7
0	3.5	2	-	-	-
1	0	0	-	-	-
2	14.0	8	-	-	-
3	22.8	13	-	-	-
4	24.6	14	-	-	-
5	17.5	10	-	-	-
6	7.0	4	-	-	-
7	10.5	6	-	-	-

Table 5: Continued – Summary of diabetes self-care activities characteristics (n=57).

MEASURES	%	*n*	Mean	SD	Min-Max
T2DM SELF-CARE ACTIVITIES					
Diet last 7 days – *How many days did you eat high fat foods (i.e. red meat or full-fat dairy):*	100	57	3.79	1.58	1-7
0	0	0			
1	5.3	3			
2	15.8	9			
3	21.1	12			
4	35.1	20			
5	8.8	5			
6	3.5	2			
7	10.5	6			
Exercise last 7 day – *How many days did you participation in a specific exercise session:*	100	57	3.25	1.87	0-7
0	14.0	8			
1	3.5	2			
2	10.5	6			
3	24.6	14			
4	24.6	14			
5	15.8	9			
6	0	0			
7	7.0	4			
Blood Sugar Testing last 7 days – *How many days did you test your blood sugar:*	98.25	56	5.30	2.54	0-8
0	8.8.	5			
1	5.3	3			
2	5.3	3			
3	3.5	2			
4	8.8	25			
5	3.5	2			
6	3.5	2			
7	56.1	32			
I only test my blood sugar when I don't feel well	3.5	2			
Missing data	1.8	1			

Table 5: Continued – Summary of diabetes self-care activities characteristics (n=57).

MEASURES	%	*n*	Mean	SD	Min-Max
MEDICATIONS					
Insulin injection last 7 days – *How many days did you take your recommended insulin injections:*	96.49	55	6.73	2.02	0-9
0	7.1	4	-	-	-
1	1.8	1	-	-	-
2	0	0	-	-	-
3	1.8	1	-	-	-
4	0	0	-	-	-
5	1.8	1	-	-	-
6	1.8	1	-	-	-
7	52.6	30	-	-	-
I do not use insulin injections	29.8	17	-	-	-
Missing data	3.5	2	-	-	-
Diabetes pills last 7 days – *How many days did you take your recommended number of diabetes pills*	100	57	6.68	2.07	0-9
0	7.1	4	-	-	-
1	0	0	-	-	-
2	1.8	1	-	-	-
3	3.5	2	-	-	-
4	1.8	1	-	-	-
5	1.8	1	-	-	-
6	5.3	3	-	-	-
7	40.4	23	-	-	-
I do not use diabetes pills	38.6	22	-	-	-
SELF-CARE					
Foot Care last 7 days – *How many days did you check your feet:*	98.25	56	4.12	2.79	0-7
0	21.1	12	-	-	-
1	3.5	2	-	-	-
2	5.3	3	-	-	-
3	8.8	5	-	-	-
4	12.3	7	-	-	-
5	3.5	2	-	-	-
6	8.8	5	-	-	-
7	35.1	20	-	-	-
Missing data	1.8	1	-	-	-
Smoking last 7 days – *Have you smoked a cigarette – even one puff:*	100	57	-	-	-
Yes	96.5	55	-	-	-
No	3.5	2	-	-	-

Results of Hypotheses Testing

Home Demands / Control at Home (Home Strain) & HbA1c

Question 1: Is there an association between the demands of unpaid home/familial responsibilities and HbA1c?

Hypothesis 1: Higher scores on the *Home Demands* and *Control at Home* scale (home strain) will be associated with an HbA1c greater than 7.0%.

A linear regression was conducted to address the general research question by assessing relationships between each individual independent variable [*Home Demands*, *Control at Home, Home Strain* (Home Demand + Control at Home)] and the continuous dependent variable (HbA1c). There was no significant relationship with: *Home Demands, F(1, 48) = .032, p=.860; Control at Home, F(1, 48) = .012, p= .915* and *Home Strain, F(1,48) = .161, p= .690* (Table 6).

To test Hypothesis 1, a multivariate logistic regression was performed to ascertain the effects of *Home Demands* and *Control at Home* have on glycemic control (controlled vs uncontrolled HbA1c). The logistic regression model was not statistically significant, $\chi 2(2)= .745$, $p = 0.689$. The model explained 2.0% (Nagelkerke R^2) of the variance in glycemic control (HbA1c controlled vs uncontrolled) and correctly classified 62% of cases. Sensitivity was 100% and specificity was 0%. Of the two predictor measures none were statistically significant: home demands, (p=0.426; odds ratio [OR]: 1.524; 95% confidence interval [CI]: 0.540-4.302); control at home, (p=0.968; OR: 1.009; 95% CI: 0.639-1.594) and the constant (p = 0.677) was not different from 0. In other words, the multivariate logistic regression analysis showed that there is no significant difference among *Home Demands* and *Control at Home* scores in having poor glycemic control (i.e. uncontrolled HbA1c $\geq$7.0%) as compared to glycemic control.

Job Strain and HbA1c

Question 2: Is there an association between the demands of paid work and HbA1c?

Hypothesis 2: Higher scores on the *Job Content Questionnaire* (>1.0; job strain) will be associated with an HbA1c greater than 7.0%.

A linear regression was conducted to assess relationships between each individual independent variable [*JCQ-27 (Job Strain)*, *JCQ-Psychology, JCQ-Physical, and Assessment of Occupational Physical Activity*] and the continuous dependent variable (HbA1c). There was no significant relationship with: *JCQ-27 (Job Strain)*, $F(1, 48) = .559$, p= .458; *JCQ-Psychology, F(1, 48) = .593, p= .445; JCQ-Physical, F(1, 48) = .363, p= .550; Assessment of Occupational Physical Activity, F(1, 48) = .375, p= .543* and *Standard Occupation Classification, F(1, 48) = 1.856, p= .179* (Table 6).

A multivariate logistic regression analyses was conducted to test Hypothesis 2. Employment variables included in the model were years with title, hours worked per week, *JCQ-27 (Job Strain), JCQ*-psychological, *JCQ*-physical and Assessment of Occupational Physical Activity. The resulting Nagalkerke R^2 (.237) was an adequate model and the Hosmer & Lemeshow ($p = .552$; $p>.05$), indicated that the model is an adequate fit at predicting the categorical outcome. However, the logistic regression model was not statistically significant, $\chi2(5) = 9.560$, $p=.089$. The model explained 17.2% (Cox & Snell R^2) to 23.7% (Nagelkerke R^2) of the variance in the outcome variable (HbA1c control) and correctly classified 72% of cases. Specificity of prediction was 52.6%, which allows us to correctly classify 52.6% of the participants as *controlled* (e.g. having HbA1c under control, otherwise, true negative rate). Sensitivity of prediction or true positive rate was 83.9%, which was the proportion of participants with uncontrolled blood glucose (HbA1c) who were successful or correctly

classified as such. The overall classification success rate was 72%, an increase from the intercept-only model's 62%. Predictors were not significant: years with title (p=.123, OR:1.639, 95% CI: .875-3.072), hours worked per week (p=418, OR: .973, 95% CI: .911-1.039), JCQ-27 (p=.913, OR: 1.107, 95% CI: .182-6.735), JCQ-psychological (p=.232, OR: .516, 95% CI: .175-1.525), JCQ-physical (p=.804, OR: 1.125, 95% CI: d assessment of occupational physical activity (p=.109, OR: .516, 95% CI: .230-1.160). Only the constant was statistically significant (*p*= .042). The multivariate logistic regression analysis found that there was no statistically significant difference in HbA1c control and years with title, hours worked per week, JCQ-27, JCQ-psychological, JCQ-physical, and assessment of occupational physical activity.

Family Support and HbA1c

Question 3: Is there an association between family support for paid workers and HbA1c?

Hypothesis 3: Lower *Family Support Inventory for Workers* scores will be associated with an HbA1c greater than 7.0%.

A linear regression was used to assess relationships between the predictor (Family Support Inventory for Workers) and the outcome variable (HbA1c). Family Support Inventory for Workers scores did not explain a significant association in HbA1c control. Therefore, there was no statistical significant relationship, *p*=.501 (Table 6).

A simple logistic regression was performed to ascertain FSIW on the likelihood that participants have poor glycemic control (uncontrolled HbA1c). The logistic regression model was not statistically significant, $\chi 2(1)$= .085, p = 0.770. The model explained .2% (Nagelkerke R^2) of the variance in glycemic control (HbA1c) and correctly classified 62% of cases. Sensitivity was 100% and specificity was 0%. The predictor measure was not statistically significant: family support for workers *(FSIW)*, (p=0.771, OR: 1.126; 95% CI: .505 – 2.510); and

the constant (p = 0.878) was not different from 0. In other words, the simple logistic regression analysis showed that there is no significant difference among family support for workers in having poor glycemic control (i.e. uncontrolled HbA1c $\geq$7.0%).

Psychological Distress and HbA1c

Question 4: Is there an association between distress and HbA1c?

Hypothesis 4: Severe distress scores will be associated with an HbA1c greater than 7%.

A linear regression analysis was also conducted to assess relationships between *GHQ-12* scores and the HbA1c test levels (Table 6). The findings indicated that there was no statistically significant relationship, [$F_{(1, 48)}$ = .067, p=.797].

A multiple logistic regression was performed to ascertain the association of psychological distress with likelihood that participants have poor glycemic control, controlling for home strain, job strain, and family support. The logistic regression model was not statistically significant, $\chi^2(5)$ = 2.349, p = .799. The model explained 6.2% (Nagelkerke R^2) of the variance in glycemic control (HbA1c) and correctly classified 62.0% of cases. Sensitivity was 90.3% and specificity was 15.8%. Of the five predictor variables none were statistically significant: home strain (Home Demands, p=.362; OR: 1.680; 95% CI: 0.551-5.123; Control at Home, p=.716, OR: .905; 95% Cl: .530-1.548), job strain (JCQ-27, p=.945; OR: .939; 95% CI: .160-5.502), family support for workers (FSIW, p=.856; OR: 1.099; 95% CI: .395-3.062), psychological distress (GHQ-12, p=.291; OR: .936; 95% CI: 0.828-1.058) and constant (p = 0.969) was not different from 0. In other words, the multivariate logistic regression analysis showed that there was no significant difference among home strain, job strain, family support for workers and psychological distress scores in having poor glycemic control (i.e. uncontrolled HbA1c $\geq$7.0%).

Table 6: Results of Univariate Linear Regression Models (HbA1c predicted from one variable at a time) (N=57)

INDIVIDUAL MEASURES	b	SE	β	t	p	R²	Adjusted R²
Family							
Home Demands	.079	.447	.026	.178	.860	.001	-.020
Control at Home	-.021	.195	-.016	-.108	.915	.000	-.021
Employment							
Standard Occupation (LL vs HH)	-.325	.684	-.068	-.475	.637	.005	-.016
Annual Income*	-.329	.163	-.280	-2.018	*.049	.078	.059
Months with Title	.002	.003	.082	.567	.573	.007	-.014
Hours Worked per Week	-.015	.025	-.086	-.601	.551	.007	-.013
Job Demands (JCQ-27)	-.533	.713	-.107	-.747	.458	.012	-.009
JCQ Psychological Subscale	-.301	.391	-.110	-.770	.445	.012	-.008
JCQ Physical Subscale	.154	.256	.087	.603	.550	.008	-.013
Assessment of Occupation Physical Activity	.128	.210	.088	.612	.543	.008	-.013
Support / Distress							
Family Support Inventory for Workers	.257	.379	.097	.678	.501	.009	-.011
GHQ-12	.011	.042	.037	.259	.797	.001	-.019
Clinical							
Weight (lbs.)**	.014	.004	.436	3.358	**.002	.190	.173
Waist Circumference (inches)*	.048	.021	.324	2.298	*.026	.105	.085
BMI (lb./in²)**	.077	.026	.391	2.943	**.005	.153	.135
WHtR	2.536	1.373	.265	1.847	.071	.070	.050
Number of Years Diagnosed with T2DM	-.032	.035	-.132	-.921	.362	.017	-.003

Note. *p=<0.05. **p=<0.01.

Chapter 6

Discussion

Guided by the *Reserved Capacity Model* (RCM), the initial purpose of the study was to explore the association between occupational stress, familial stress, and diabetes management among aging, working Latinas with Type II Diabetes Mellitus (T2DM). However, during open enrollment the study's design was changed due to challenges encountered with the COVID-19 pandemic. As a precautionary measure and to comply with mandatory state regulation, the study's recruitment and data collection strategies were switched to accommodate a completely digital approach. Initially, recruitment was done in-person (group 1) as was data collection; this in-person approach led to the recruitment of 10 women. All 10 women were interviewed, given a questionnaire packet, and their clinical metrics were collected by the PI (weight, height, waist circumference and HbA1c). The second method for recruitment and data collection that we used was for women to self-report their data (group 2); this approach led to the recruitment of 47 women. These 47 women were screened over the phone and emailed a link to a digital platform, where they fill-out the questionnaire packet and self-reported their clinical measures (height, weight, waist circumference, and most recent HbA1c – no later than 6 months). Continuing with the main purpose of the study, this exploratory study sought to explore the relationship between home and job stress on T2DM management among working Latinas.

Aging Women

Sixty-nine percent of women over the age of 40 experienced job strain, of these women, 38% had uncontrolled HbA1c test levels. Mean body mass index (BMI) among women over 40 was higher (34 ± 10.23) as compared to women under the age of 40 (27.73 ± 6.90), with a statistically significant difference of 6.27 (95% CI, -10.77 to -1.65), $t(54) = -2.73$, $p = .009$. Of

the women over 40, 62% had high risk BMI's ($\geq$25; obesity class I), with 31% reporting having

never been given a diet plan by their PCP and 35% not having enough tangible resources to meet

their monthly needs. Considering the overall combined average scores of both the *Home*

Demands scale and *Control at Home* scale, women with uncontrolled HbA1c, on average, were

more likely to experience increased home stress. Considering the Karasek's "Job Strain" model

(1990), which stresses the importance the interaction between demands and control has on

causing stress. One can apply the same key concepts to evaluate "Home Stress" and infer

increased home demands and decreased home control have an effect on one's overall stress at

home (Schnall, Landsbergis & Baker, 1994). The key findings showed there was no significant

statistical difference (<.05) between the controlled group and uncontrolled group on overall

home stress and job stress scores (Appendix C). And, there was no statistically significant

difference between home stress and work stress for women over 40 as compared to women under

40. There was also no statistically significant difference between psychological distress scores

(GHQ-12) among women over 40 as compared to women under 40. However, as women age

there is a statistically significant difference in BMI among between women under 40 compared

to those 40 and over.. This may indicate that sustained or chronic stress leads to the activation of

hypothalamic-pituitary-adrenal axis (HPA) and/or sympathetic nervous system mechanism that

may lead to increased visceral obesity (Scott, Melhorn, & Sakai, 2012).

Job Stress

We wanted to know if there was an association between home demands, control at home,

job strain for paid workers and control of HbA1c. Although, we did not find a significant

association between these measures and HbA1c control. We did find a significant association

between home demands, weight, and control of HbA1c.

Job Content Questionnaire (*JCQ-27*) scores greater than 1 indicate job strain, meaning

that the respondent had a combination of high job demands and low job decision latitude (i.e.

low control). The mean *JCQ-27* scores for women with uncontrolled HbA1c levels were 1.28 $\pm$

0.41, indicating that the women from the uncontrolled group on average experienced job strain.

Again, there was no statistically significant difference ($p<.05$) between the controlled group and

uncontrolled HbA1c group's overall *JCQ-27* (job stress) scores (Appendix F), however, the

controlled HbA1c group had slightly higher *JCQ-27* score 1.35 (SD: 0.36). These results are

consistent with other job strain studies that examined low-status occupations that frequently

result in high job strain, such as nurses' aides – the primary occupation of our uncontrolled

HbA1c group (Bonsaksen, Thørrisen, Skogen, & Aas, 2019; Karasek et al., 1998).

Women disproportionately occupy low-status, low-paying jobs, specifically Latina

women (Gould & Kugler, 2017; Leanin, 2019). In fact, 80.7% of the participants were in low-

status, low-paying occupations (e.g. nursing aides, secretaries, retail salesclerk, janitors, house

keepers, production assemblers). In this current study, there was no statistically significant

difference between HbA1c levels and standard occupation group [lower-status, lower-paying

(LL) versus higher-status, higher-paying (HH)]. Both groups had uncontrolled HbA1c's, with the

LL group having had slightly higher scores (*M:* 7.81; SD: 2.07; Min-Max: 5.1-17.0) as compared

to the HH group (*M:* 7.48; SD: 1.16; Min-Max: 5.5-10.0), t(48)=-.573, p= .569 (Appendix E - F).

Moreover, the literature substantiates that job strain may be more deleterious among

workers with low SES, as the lack of tangible resources and higher income seem to increase the

effect of job strain on health (Kuper & Marmont, 2003; Cheng, Kawachi & Coakley, 2000;

Karasek & Theorell, 1990). Our data indicated that 29.8% of participants reported not having

enough tangible resources to meet their monthly needs and 9% reported not having any health

insurance. Women without enough tangible resources, overall, experienced higher levels of job strain (1.37) and psychological distress (GHQ-12: 19.53) as compared to women who reported having enough tangible resources (Job strain:1.27 & GHQ-12: 12.53). Although, women with and without sufficient tangible resource experienced job strain - the group that reported not having enough tangible resources had significantly higher GHQ-12 scores. According to the psychometric screening questionnaire scoring system, mean scores greater than 20 suggests severe problems and psychological distress. Both women with and without tangible resources had HbA1c levels greater than 7.0%.

We also expected to find that higher scores on the *Home Strain (Home demands & control at home)* and *Job Strain* (*Job demands & control at work*) questionnaires would be associated with a higher HbA1c ($\geq$7.0%). Rather, we found that there was no difference between the HbA1c scores of the two groups (controlled vs uncontrolled). This strain as experienced by the women could have been due to the current national issue of Latinas having the largest wage gap of all ethnicities, races and genders, regardless of education level. In fact, the wage gap widens for Latina women with higher education (Bureau of Labor Statistics, 2019; Lean In, 2019). Regardless, of one's work demands or HbA1c control, if there is an effort-reward imbalance (ERI), injustice or blatant disregard for equity (unfair wage for work rendered), people will experience stress (Greenberg, 2006; Siegrist, 2005, Siegrist et al., 2004; Siegrist, 1996; Notelaers, Törnroos & Salin, 2019). According to the ERI model, reward and justice are connected, as reward reflects distributive justice (Siegrist, 2001). Being recompensed for one's effort with lack of career opportunities, meager upward mobility, poor financial growth prospects, lack of recognition, or inequitable pay may be seen as unjust consequently increasing one's stress (Colquitt, 2001).

Home Stress

Both controlled and uncontrolled HbA1c groups experienced home strain equally (Appendix F). Although, the effects of unequal gender roles and responsibilities at home may have a deleterious effect on one's health and well-being, we were unable to detect a difference. This may be due to the small sample size. The job strain model from Karasek-Theorell (1979, 1990) offers an explanation about home strain in that working women who have concurrent low decision latitude at home (low control) and high home demands cannot moderate the stress caused by the high home strain. Therefore, the constraints a woman experiences at home that limit her decision making, together with high home demands, produce the unhealthy condition of stress at home, or "home strain". It is important that future studies explore the effects of home strain on glycemic control with a larger sample size.

The overall interpretation of the study findings are that both groups experienced home stress (home demands / control at home) and job stress (work demands / control at work) equally; there was no statistically significant difference between women with controlled and uncontrolled HbA1c levels. However, weight and *Home Demands* were statistically significant predictors for HbA1c test levels. As previous studies have identified, a linear relationship between weight reduction and glycemic control via lowering HbA1c test levels (Gummesson, Nyman, Knutsson, & Karpefors, 2017; Balducci, et al., 2014; Balducci, et al., 2012; Balducci, et al., 2010; Boule et al., 2001; Snowling & Hopkins, 2006; Di Loreto, C. et al., 2005; Otiniano et al., 2012). Specifically, Gummesson and collogues (2017) found that for every kilogram reduction in body weight, there was an estimated mean decrease of HbA1c test levels by 0.1%. Our data also demonstrated the positive association between weight and HbA1c test levels, predicting that with every one pound increase in weight there was a .013 increase in HbA1c test

levels. However, the key findings showed that there was no difference in frequency of reporting

obesity for women in the controlled HbA1c and uncontrolled HbA1c groups, with 47.4% and

51.6% categorized as clinically obese, respectively.

Perhaps cultural constructs and the combination of working long hours outside the home

while still maintaining a traditional division of household labor, such as cooking household

meals, may have women cooking meals that are not in line with a healthy eating plan (Wang,

Parker, Taylor, 2013). Furthermore, managing the dietary desires of an entire household while

still managing one's own healthy lifestyle requirements, can prove arduous and difficult. A

qualitative study identified the lack of family support as a possible barrier for women managing

T2DM; one of their participants said, "…my husband is not used to eating what I eat. He eats

how I used to eat and it's all junk food…it is difficult to make separate food for him, for my

daughter, and me" (Hu et al., 2014, p. 8).

Correspondingly, it is diet (nutrition) in combination with exercise that are the key

components of a successful strategy for diabetes management. Finding time to take care of one's

health is time consuming. Scheduling time, in an already busy and taxing day to exercise or

prepare one's own meal can be a major struggle for women. According to Kaltman and

colleagues (2015), common challenges with diabetes management include the task of eating

healthy. A key informant reported that, "Sometimes the family does not assimilate how much

support the person needs . . .[but] when they do it as a family, it is more likely that this person

can make it differently than when feeling isolated and alone" (Kaltman, 2015, p. 767). Our data

indicated that only 22.8% of our participants exercised 5-7 days per week, and only 24.6% of

participants reported following a healthy eating plan 7 days in the past week. Research shows

that the combination of calorie restriction and weight loss, with an increase in physical activity

and fitness are significant contributors to T2DM remission (Astrup & Finer, 2000; Magkos, Hjorth & Astrup, 2020). Our data shows that only 10.5% of the controlled HbA1c group reported not having a diet plan, as compared to 38.7% in the uncontrolled HbA1c group. A study investigating intentional reduced intake of carbohydrates (50% to 30%) among obese patients with T2DM found that after 6 weeks, fasting glucose concentrations ($P < 0.05$) and HbA1c levels ($P < 0.001$) had reduced; also, liver fat content ($P < 0.01$) and pancreas fat content ($P < 0.05$) both also decreased (Skytte, et al., 2019).

Family Support for Workers

We wanted to know if family support for women who did paid work was associated with HbA1c levels of the worker. Understanding the effects of *family support* on glycemic control may be useful as most working women return home to a second shift of unpaid domestic labor and caregiving. And, the literature demonstrates, social support and adequate social networks can buffer the effects of strain (Kuper & Marmot, 2003; Johnson & Hall, 1988). However, we found that family support for paid workers did not affect the HbA1c levels of the worker. Our data demonstrated there was no significant difference between group scores on the *Family Support Inventory for Workers*. Perhaps this could be explained by two interconnected social and gender specific constructs discussed previously, "familismo" and "marianismo." Culturally, many Latinos exhibit strong fidelity, loyalty and solidarity to their traditional Hispanic/Latino families (Vega, 1990; Segura & Pierce, 1993). Thus, it is possible that women did not feel comfortable honestly answering questions on the *Family Support Inventory for Workers*. Perhaps their scores can be explained by the familial loyalty they feel and the difficulty they had with identifying an issue or shortcoming in one's family.

Psychological Distress

We sought knowledge about any association between psychological distress and uncontrolled HbA1c levels. With regard to the *General Health Questionnaire* (*GHQ-12*), there was no significant difference between scores for women in the controlled and uncontrolled HbA1c groups. This may be due to the mental health perceptions and stigmas within the Hispanic/Latino community (DeFreitas, Crone, DeLeon & Ajayi, 2018). The stigmatization surrounding mental illness may be related to an overall lack of knowledge (Corrigan & Watson, 2007; Mendoza, Masuda & Swartout, 2015). Participants' negative perceptions, fears or anxieties regarding mental illness may have influenced their responses about their general health in the GHQ-12 questionnaire (Vega, Rodriguez & Ang, 2010).

Furthermore, there were no significant differences between *General Health Questionnaire (GHQ-12)* and HbA1c scores for women who participated in-person in the study (group 1) and those who self-reported data online (group 2). However, participants from group 1 (GHQ-12: 15.50; HbA1c: 8.16) had higher distress scores and HbA1c scores as compared to group 2 (GHQ-12: 14.43; HbA1c: 7.64). Scores of about 11-12 are normal, however, a score greater than 15 suggests evidence of distress. The difference in distress and HbA1c scores maybe explained by the fact that in-person (group 1) had lower-status, lower-paying jobs and much less in annual income ($25,000 to $34,999) as compared to self-reported ($50,000 to $74,999). A previous cohort study with 11,546 adult diabetic, high-risk/undiagnosed diabetic, and nondiabetic participants found that HbA1c levels were higher in diabetic participants with distress as compared with those without (7.86% versus 7.40%; $p = .008$) (Hamer et al., 2010). Of the 15 participants that had GHQ-12 scored >15, indicating evidence of psychological distress, 53.3% had uncontrolled HbA1c levels.

Furthermore, stress resulting from effort-reward-imbalance or job strain may, as discussed above, result in mental health problems (Bonde, 2008). This is reflected in our data in that it suggests that job strain was a significant predictor of psychological distress.

Our analysis did not uncover statistically significant relationships between the study's main predictor variables [Home Demands, Control at Home, Job Demands & Control, Family Support for Workers, and General Health Questionnaire] and the outcome variable (controlled and uncontrolled HbA1c). It is important to consider that these findings are based on a relatively small sample size, thus, it is highly probable that significant paths between familial and job stress and glycemic control (HbA1c test levels) could emerge if the study was done with a larger sample.

Overall, regardless of age, women experienced psychological distress/strain, home strain and job strain equally. While just under three quarters of our sample (73.7%) were given a diet plan from their PCP, 62% had uncontrolled glycemia (HbA1c). Perhaps, gender and its socio-cultural context increased socio-cultural demands for our sample, which may have led to increased emotional and physiological reactivity to stress due to a lack of resources (i.e. "reserve capacity"). Furthermore, it is possible that limited opportunities to refill resource reserves, over time, led to repeated physiological stress responses for the women. Stress combined with unhealthy behavioral coping strategies and lack of resources to allocate to diabetes management (such as time and money), take their toll, which could increase vulnerability to poor glycemic control (McEwen, 1998; Myers & Hwang, 2004) and possibly accelerate the biological effects of poor diabetes management (Epel et al., 2006; Gallo & Matthews, 2003; Gallo, 2009). Among all participants in our sample, indictors of poor diabetes management were evident regardless of glycemic control (HbA1c), with over half (56.2%) of our participants overweight/obese, over

half (53.5%) reporting poor medication adherence, well over half (65%) reporting that they had not checked their feet daily, and almost a third (31%) reporting they had never had an eye exam. All of these are quality indicators of T2DM management. Therefore, further studies with more power are needed in order to develop culturally appropriate interventions that improve management of diabetes within this understudied population.

Chapter 7

Conclusion

The National Institute of Health (2014) reported that within healthcare the knowledge of Latino health is meager and insufficient. Early in the 21st century, Doty and Holmgren (2006) explained there was a major disconnect between Latinos and the healthcare system. Indeed, a landmark study with 16,415 Latinos found that only about half of people from all Latino groups with diabetes had it under control (Schneiderman et al., 2014). As dismal as their findings were, ours are even worse. It is worth reemphasizing that our study found that just 38% of our participants had their diabetes under control which means that well over half (62%), did not. Glycemic control in our sample was lower than expected. Although 73.7% of participants were given a diet plan from their PCP and 69% had a routine eye exam, there appears to be a disconnect between Latinas and their healthcare management teams or providers (Chukwueke & Cordero-MacIntyre, 2010). Even more concerning is that 12.5% of our sample reported not checking their blood sugar or taking their diabetes medication within the last 7-days. As a self-managed disease, T2DM can be expensive and time consuming to manage. However, there is a lack of culturally proficient health care service providers and this lack of understanding of Latino health, widens the divide between patient and provider. This divide can further increase health disparities, increase the burden of illness, and lower the quality of life among working Latinas with families.

Implications for Future Research

Our results call for future research to continue the trajectory of this study with larger samples (for example, a minimum of 100 participants; n=100). In order to improve accuracy with the clinical measures, we aim to design research that involves collecting all clinical data in-

person. Other future research should explore the gender differences of occupational demands and familial demands on diabetes management among aging, working Latinos with T2DM. A potential working title for a future study could be: Understanding Gender Differences in Work and Family Demands and T2DM Management among Working Latinos. Ultimately, the purpose of such a study would be to determine how occupational demands and familial demand affect diabetes management based on gender and language-based acculturation in Latino men and women with T2DM. Another future study could investigate differences in gender and perceived occupational and familial support on diabetes management among working Latinos with T2DM. A possible title for such a study could be: Understanding the Effect of Gender Differences, Perceived Work and Family Support on Disease Self-Management among Latinos with T2DM. Insight from these studies could better inform healthcare providers. Exploration may provide insight into the effect of familism and the behavioral aspects of work and family demands related to T2DM management among working Latinas. As this is an understudied population, there are gaps in the literature regarding the effects of familism, occupational demands, and familial (home) demands on glycemic control. These studies will fuel future studies to develop culturally competent interventions that encourage early detection and improve management of diabetes within this understudied population.

Implications for Public Health

Insight from this study can inform the design of future research. However, with regard to implications for public health, our exploratory study did not have enough power to make claims for public health, policy and/or practice.

Limitations

Due to the current COVID-19 pandemic we had to change the recruitment and data

collection method of the original study which led to the formation of two different data collection groups (in-person and online-self-reported). There is the possibility that, with self-reporting HbA1c levels, participants may have underreported their levels to project a more clinically acceptable level to researchers.

Furthermore, with self-reported measures like weight, height and waist circumference, participants could report their measures to fit more socially accepted measures. This was shown to be a problem and described in epidemiologic studies as *self-report bias*; the authors stated that participants tend to underreport weight and overreport height (Nawaz et al., 2001). Comparatively, Maukonen and colleagues (2018), found that the prevalence of weight and height self-reporting bias was greater among overweight and obese participants. Conversely, in a study of 2,643 participants, Hodge and colleagues (2020) found that although participants slightly underreported weight and overreported height, the misclassification rate for women was 7%. They concluded that self-reported calculated BMI (weight and height) remained a valid measure.

Another limitation to consider is the *healthy worker effect* (LaMorfe, 2020). This special type of selection bias maintains that the employed workforce tends to be healthier than the non-employed population. Non-employed populations typically include individuals who cannot work due to severe illness and/or disability. The main disadvantage in our sample was that it only included employed participants, thus they may have been healthier in general, and with better maintained glycemic control or better well-being overall.

The small sample size (n=50) for this exploratory study was also a limitation as there was not enough power to identify statistical differences that could have been found with a larger sample. A future study with a minimum 100 participants will be important in order to increase the detection of small but clinically relevant effects. Also, future studies with larger samples

could support the estimation of more complex statistical models. For instance, this may involve including interaction effects from moderator variables and/or structural models posing direct and indirect relationships.

Furthermore, cross-sectional studies cannot prove causality. They can only help generate casual hypotheses. In fact, due to our study's design, specifically the self-reported data collected from group 2, results are vulnerable to reporting bias and potential errors. Additionally, only 18% of our sample population were between the ages of 50-63. This suggests that perhaps the study was limited to a particular age stratum and thus, information provided from participants cannot be generalized to all adult Latinas. There are further limitations to generalizability based on the sampling method we used for collecting data in-person for group 1 because it was limited to subjects from a large metropolitan area of southern California, which has predominately Hispanic/Latinos of Mexican decent. This means that Latinos of Cuban, Puerto Rican, Dominican descent or from other countries were less represented in this region.

Despite the potential limitations, the fundamental purpose of conducting an exploratory study is to examine the feasibility of the study protocol and identify weaknesses in the study. Our study brought insight about testing whether the study's tools were asking the intended questions (reliability), whether the format was comprehensible, and whether the selected validated tools were appropriate for the target population. Our study also allowed us to obtain preliminary data in order to calculate a required sample size and effect size for a future study. Ultimately, the data from this exploratory study is primarily descriptive but very useful for a future follow-up study.

Strengths

The demographics of the US are changing. It is estimated that by 2060, Hispanic/Latino-Americans will make up 28% of the U.S. population. (CDC, 2018). Therefore, understanding the effects of cultural constructs such as familism is an important to enhancing the quality of nursing

practice and care delivery. Nolle et al. (2012) reiterated this point by stating that, "it is important

that service providers understand the ways in which Hispanic cultural values are expressed, and

how they impact individuals' and families' functioning" (p. 319). Further knowledge of how

cultural values, such as family and gender roles, are expressed can assist in developing culturally

appropriate interventions (Nolle, Kuhlberg, & Zayas 2012). This knowledge will help

researchers understand the modern complexities that aging, working Latina face as they seek to

balance work, family, and health demands. Ultimately, this study informs nursing practice and

the healthcare field about the cultural and behavioral factors that influence Latino health and

well-being. Insight derived from our findings may help future researchers design studies to test

interventions for this understudied population, to lower health disparities, and to help reduce the

healthcare disconnect between providers and Latino patients.

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Appendix A

Exploratory Instrumentation Reliability - Cronbach's Alpha Coefficient

Cronbach's alpha (α) coefficient was conducted in order to provide an overall reliability coefficient for a set of specific independent (predictor) variables to determine internal consistency (Appendix A - Continued). Six main predictors were analyzed using Cronbach's alpha (*Home Demands, JCQ-27*, *JCQ-Psychology* subscale, *JCQ-Physical* subscale, *Family Support Inventory for Workers*, and *GHQ-12*). Both user-missing and system missing values were excluded from the Cronbach's alpha coefficient test.

Overall, the results indicated that all six questionnaires had a medium to high level of internal consistency. Some better than others, with the lowest α = 0.709 (*JCQ-Psychology* subscale) and the highest α = 0.972 (*Family Support Inventory for Workers*). An additional Cronbach's alpha was conducted using a split file analysis to further explore the questionnaire's reliability and internal consistency between in-person participants (group 1) and self-reporting participants (group 2). For each group the Cronbach's alphas' were calculated. The analysis indicated that the overall internal consistency remained roughly the same (Appendix A - Continued) – except for *JCQ-Psychology* subscale self-reporting participants (G1 =0.803; G2 = 0.664). Although, the *JCQ-Psychology* subscale still remained the lowest Cronbach's alpha out of all the questionnaires, the self-reporting participants score's decreased below the recommended values of 0.7 or higher (DeVillis, 2003; Kline, 2005). However, the *Family Support Inventory for Workers* questionnaire remained at a high level of internal consistency, as determined by a Cronbach's alpha for in-person (group 1) = 0.983 and self-reporting (group 2) = 0.964.

Appendix A

Continued - Exploratory Instrumentation Reliability (Cronbach's Alpha Coefficient)

	Home Demands	JCQ-27	JCQ-Psychology	JCQ-Physical	FSIW	GHQ-12
All participants (α) (n=57)	0.841	0.797	0.709	0.930	0.972	0.895
EXPLORATORY	Home Demands	JCQ-27	JCQ-Psychology	JCQ-Physical	FSIW	GHQ-12
In-person: Group 1 (α) (n=10)	0.823	0.803	0.803	0.942	0.983	0.954
Self-reporting: Group 2 (α) (n=47)	0.845	0.806	0.664	0.925	0.964	0.861

Note. JCQ-27 = Job Content Questionnaire (27 items); FSIW = Family Support Inventory for Workers (44-items); GHQ-12 = General Health Questionnaire (12 items).

Appendix B

Exploratory Results of Stepwise Linear Regression Analysis

Additional multivariate exploration of the general research questions using the

continuous HbA1c measure employed stepwise multiple regression analysis. It was conducted to

further evaluate whether different dimensions of home strain, job strain and health, predicted

HbA1c test levels. Of the different dimensions of the 16 selected predictors measures (age,

education level, annual household income, months with title, hours worked per week, Home

Demands, Control at Home, JCQ-27, JCQ-Psychology, JCQ-physical, FSIW, GHQ-12, height,

weight, waist circumference, and number of years diagnosed with T2DM), only two appeared as

significant predictors of HbA1c (outcome measure). In step 1 (model one), weight was

significantly related to HbA1c test levels, $F(1, 45)= 5.324$, $p= 0.026$, accounting for 10.6% of

the variation in HbA1c concentration with adjusted $R^2 = 8.6\%$, a small size effect according to

Cohen (1988). Then the stepwise procedure added Home Demands (model two), weight and

Home Demands were upheld as significant predictors that in combination contributed

significantly to HbA1c test levels, $F(2, 44) = 5.511$, $p = 0.007$. The R^2 was .200 ($f^2=0.250$), this

reflects a medium effect size according to Cohen (1988, 1992). The adjusted R^2 was .164

indicating approximately 16.4% of the variance in HbA1c can be predicted by the variables,

weight and *Home Demands*. The intercept (constant) for both model 1 ($p=.000$) and 2 ($p=.013$)

were statistically significance, $p<0.05$. The regression equation with model 1 predicts that with

every unit increase (1 lb.) in the independent variable (weight), there is a predicted increase in

HbA1c test levels by 0.008 ($B=0.008$, $p=0.026$). Furthermore, model 2 unstandardized

coefficients (B) indicate that for every one pound increase in the predictor variable (weight),

there is a predicted increase in the outcome variable (HbA1c test levels) by 0.009 of a unit

(*B*=0.009, *p*=0.012). And, for every one point increase in the *Home Demands* score, there is a predicted increase in HbA1c test levels by .72 of a point (*B*=0.716, *p*=0.027).

Appendix B

Continued – Exploratory Results of Stepwise Linear Regression Analysis (N=57)

MODEL 1	*b*	SE	*β*	*t*	*p*	df	F	R²	Adjusted R²
Model Fit	-	-	-	-	*.026	1 , 45	5.324	.106	.086
Weight (lbs.)	.008	.004	.325	2.307	*.026	-	-	-	-
MODEL 2	*b*	SE	*β*	*t*	*p*	df	F	R²	Adjusted R²
Model Fit	-	-	-	-	**.007	2 , 44	5.511	.200	.164
Weight (lbs.)	.009	.003	.357	2.637	*.012	-	-	-	-
Home Demands	.716	.314	.309	2.281	*.027	-	-	-	-

 Note. This exploratory analysis was conducted to further evaluate different dimensions of home, work and health in a multivariate context. Dependent variable was HbA1c. The predictors that were eligible for entry into the model was: age, education level, annual household income, months with title, hours worked per week, Home Demands, Control at Home, JCQ-27, JCQ-Psychology, JCQ-physical, FSIW, GHQ-12, height, weight, waist circumference, and number of years diagnosed with T2DM. *p=<0.05. **p=<0.01.

Appendix C

Exploratory Comparison of In-person & Self-Report Data Collection Groups

The exploratory analysis comparing in-person interview with self-report survey found that in-person participants had statistically significantly higher ages (*M:* 48.20; SD: 9.75) as compared to self-report participants (*M:* 38.47; SD: 9.00 years), t(55)= 3.060, p=.003 (Appendix D). There was a statistically significant difference in the hours worked, in-person participants had lower hours worked (*M:* 29.15; SD: 12.26) as compared to self-reporting (*M:* 41.02 hours; SD: 10.65 hours), t(55)= -3.118, p=.003.

In-person participants had statistically significantly lower *Control at Home* scores (*M:* 3.40; 1.78) as compared to self-reporting (*M:* 4.68; SD: 1.18), t(10.76)= -2.18, p=.006. As for the *Job Content Questionnaire* scores, in-person participants had statistically significantly lower scores (*M:* 1.09; SD: 0.27) as compared to self-reporting (*M:*1.35; SD: 0.38), t(55)= -2.054, p= .045. There was a significance difference with *Assessment of Occupational Physical Activity* scores, with in-person having significantly higher scores (*M:* 2.90; SD: 1.45) as compared to self-reporting (*M:* 2.00; SD: 1.22), t(55)=2.056, p= .045. In-person participants had statistically significantly higher waist circumferences (*M:* 44.90 inches; SD: 6.62 inches) as compared to self-reporting (36.28 ± 9.46 inches), t(52)=2.724, p=.009. BMI was also statistically significant, with in-person participants having significantly higher BMI scores (*M:* 36.63; SD: 8.70) as compared to self-reporting (*M:* 30.06; SD: 1.2), t(55)=2.069, p=.043. Lastly, WHtR among in-person participants were significantly higher (*M:* 0.73 ± 0.11) than self-reporting (*M:* 0.56; SD: 0.14), t(52)=3.404, p=.001. Descriptive statistics for in-person and self-reported groups are reported in Appendix C and D - Continued.

Continued - Exploratory Comparison of In-person & Self-Report Data Collection Groups

(Descriptive Statistics for Selected Measures)

STUDY MEASURES	N	Mean	SD	Min-Max
Age → p=.003**	**57**	**40.18**	**9.79**	**22-63**
Group 1: In-Person	10	48.20	9.75	33-62
Group 2: Self-Report	47	38.47	9.01	22-63
FAMILY				
Home Demands Scale	**57**	**3.51**	**0.62**	**2.18-5.0**
Group 1: In-Person	10	3.71	0.70	2.36-5.0
Group 2: Self-Report	47	3.47	0.60	2.18-4.91
Control at Home → p=.052	**57**	**4.46**	**1.38**	**1-6**
Group 1: In-Person	10	3.40	1.78	1-6
Group 2: Self-Report	47	4.68	1.18	1-6
EMPLOYMENT				
Years with title	**57**	**7.09**	**6.97**	**1-37.25**
Group 1: In-Person	10	6.58	7.31	1-23
Group 2: Self-Report	47	7.19	6.97	1-37.25
Hours worked per week → p=.003**	**57**	**38.94**	**11.75**	**5.5-80**
Group 1: In-Person	10	29.15	12.26	5.5-40
Group 2: Self-Report	47	41.02	10.65	18-80
Job Content Questionnaire (>1.0 = job strain) → p=.045*	**57**	**1.30**	**0.37**	**0.69-2.50**
Group 1: In-Person	10	1.09	0.27	0.80-1.50
Group 2: Self-Report	47	1.35	0.38	0.69-2.50
JCQ – Psychological Subscale	**57**	**3.08**	**0.68**	**2.2-4.6**
Group 1: In-Person	10	2.88	0.96	2.4-4.4
Group 2: Self-Report	47	3.12	0.60	2.2-4.6
JCQ – Physical Subscale	**57**	**2.33**	**1.14**	**1.0-4.6**
Group 1: In-Person	10	2.62	1.50	1.0-3.6
Group 2: Self-Report	47	2.26	1.06	1.0-4.6
Assessment of Occupational Physical Activity → p=.045*	**57**	**2.16**	**1.29**	**1-5**
Group 1: In-Person	10	2.90	1.45	1-5
Group 2: Self-Report	47	2.00	1.22	1-5
Family Support Inventory for Workers	**57**	**2.68**	**0.71**	**1.39-4.73**
Group 1: In-Person	10	3.03	1.03	1.86-4.73
Group 2: Self-Report	47	2.61	0.61	1.39-4.00
GHQ-12 (Likert system)	**57**	**14.61**	**6.55**	**6-36**
Group 1: In-Person	10	15.50	9.94	6-36
Group 2: Self-Report	47	14.43	5.72	7-34

Note. P-values were derived using t-test analysis. For additional differences please reference Table 10b. *p=<0.05.
**p=<0.01.

Continued - Exploratory Descriptive Statistics for Selected Measures

	n	**Mean**	SD	Min-Max
CLINICAL MEASURES				
Height (inches)	**57**	**63.82**	**2.99**	**52-70**
Group 1: In-Person	10	62.15	5.04	52-67.7
Group 2: Self-Report	47	64.17	2.28	60-70
Weight (lbs.)	**57**	**180.60**	**55.42**	**112-320**
Group 1: In-Person	10	199.40	44.27	142-263
Group 2: Self-Report	47	176.60	57.12	112-320
Waist Circumference (inches) → p=.009**	**54**	**37.87**	**9.57**	**26-63**
Group 1: In-Person	10	44.90	6.62	32-52
Group 2: Self-Report	44	36.28	9.46	26-63
BMI (lb./in^2) p=.043	**57**	**31.21**	**9.38**	**17.42-54.99**
Group 1: In-Person	10	36.63	8.71	22.64-54.99
Group 2: Self-Report	47	30.06	9.19	17.42-54.91
Waist-to-Height Ratio (WHtR) → p=.001**	**54**	**.59**	**.15**	**0.41-0.97**
Group 1: In-Person	10	.73	.11	0.48-0.90
Group 2: Self-Report	44	.56	.14	0.41-0.97
Number of years diagnosed T2DM	**57**	**9.33**	**8.45**	**0.166-38**
Group 1: In-Person	10	5.58	5	0.75-16
Group 2: Self-Report	47	10.13	8.85	0.166-38
HbA1c Test Levels	**50**	**7.74**	**1.92**	**5.1-17.0**
Group 1: In-Person	10	8.16	2.15	5.5-11.8
Group 2: Self-Report	40	7.64	1.87	5.1-17.0
HbA1c (controlled=0; uncontrolled=1; critically high=2)	**50**	**.90**	**.707**	**0-2**
Group 1: In-Person	10	1.0	.943	0-2
Group 2: Self-Report	40	.87	.648	0-2
HbA1c (controlled=0; uncontrolled=1)	**50**	**.62**	**.490**	**0-1**
Group 1: In-Person	10	.60	.516	0-1
Group 2: Self-Report	40	.62	.490	0-1

Note. Home Demands Scale: higher scores means higher home demands (scale range 1-5); Control at Home: higher scores means higher control at home (scale range 1-6); Job Content Questionnaire: score >1.0 indicate job strain; JCQ Psychological subscale: higher scores means higher psychological job demands (scale range 1-5); JCQ Physical subscale: higher scores means higher physical job demands (scale range 1-5); Assessment of Occupational Physical Activity: higher scores means more physically intense occupational activities (scale range 1-6); Family Support Inventory for Workers: higher scores mean higher family support for workers (scale range 1-5); and GHQ-12 (Likert system): the higher the score the more psychological distress and lower scores indicating positive mental health (scale range: 0-36). GHQ-12 (Case scoring): a score of 3 or more is considered a positive case (evidence of a possible problem and psychological distress). Waist circumference (WC): greater than 35 inches in women means increased health risk and is categorized as abdominal obesity. BMI: greater than 29.9 is categorized as obese (Obesity Class I: 30.0 – 34.9; Obesity Class II: 35 – 39.9; Extreme Obesity Class III: ≥40). WC >35 inches and a BMI >29.9 = very high risk. WC >35 inches and a BMI ≥40 = extremely high risk. WHtR: >0.5 = high risk; central adiposity. HbA1c: controlled < 6.9%; uncontrolled 7.0% - 8.9%; critically high > 9.0%. *p=<0.05. **p=<0.01.

Appendix D

Detailed Exploratory Descriptive Statistics for Selected Measures

DEMOGRAPHICS	Group 1: In-person				Group 2: Self-report			
	n	%	Mean	SD	n	%	Mean	SD
AGE GROUP → p=.021*	10	100	3.30	.949	47	100	2.51	.953
21-29	0	0			7	14.9		
30-39	2	20			16	34		
40-49	4	40			18	38.3		
50-59	3	30			5	10.6		
60-69	1	10			1	2.1		
EDUCATION LEVEL → p=.013*	10	100			47	100		
8th Grade or Less	2	20			0	0		
Some High School	1	10			0	0		
High School Degree Or GED	2	20			5	10.6		
Some College or Technical Degree/Certificate	4	40			14	29.8		
Associates Degree	0	0			17	36.2		
Bachelor's Degree	1	10			11	23.4		
Master's Degree	0	0			0	0		
Doctorate Degree	0	0			0	0		
ANNUAL INCOME → p=.001**	10	100			47	100		
less than $25,000	5	50			6	12.8		
$25,000 to $34,999	2	20			3	6.4		
$35,000 to $49,999	1	10			5	10.6		
$50,000 to $74,999	2	20			13	27.7		
$75,000 to $99,999	0	0			12	25.5		
$100,000 to 124,999	0	0			6	12.8		
$125,000 to $149,000	0	0			2	4.3		
more than $150,000	0	0			0	0		

FAMILY	Group 1: In-person				Group 2: Self-report			
	n	%	Mean	SD	*n*	%	Mean	SD
HOME DEMANDS	10	100	3.71	0.70	47	100	3.47	0.60
CONTROL AT HOME → p=.052*	10	100	3.40	1.78	47	100	4.68	1.18
Strongly disagree (1)	2	20			2	4.3		
Moderately disagree (2)	2	20			1	2.1		
Slightly disagree (3)	0	0			1	2.1		
Slightly agree (4)	3	30			13	27.7		
Moderately agree (5)	2	20			19	40.4		
Strongly agree (6)	1	10			11	23.4		

EMPLOYEE	Group 1: In-person				Group 2: Self-report			
	n	%	Mean	SD	*n*	%	Mean	SD
JOB CONTENT QUESTIONNAIRE → p=.045*	10	100	1.09	0.27	47	100	1.35	0.38
Job Strain – YES (>1.0 = job strain)	6	60			40	85.1		
Job Strain – NO	4	40			7	14.9		
JCQ – PSYCHOLOGICAL SUBSCALE	10	100	2.88	0.96	47	100	3.12	0.60
JCQ – PHYSICAL SUBSCALE	10	100	2.62	1.50	47	100	2.26	1.06
ASSESSMENT OF OCCUPATIONAL PHYSICAL ACTIVITY →p=.045*	10	100	2.90	1.45	47	100	2.0	1.22
Mostly sitting, with some standing or walking (1)	3	30			24	51.1		
Sitting & standing equally (may include some walking) (2)	0	0			7	14.9		
Mostly standing with some walking (3)	3	30			10	21.3		
Continuous walking or other movements that increase heart rate slightly (4)	3	30			4	8.5		
Heavy manual labor that causes sweating or increases your heart substantially (5)	1	10			2	4.3		
Sporadic heavy manual labor (6)	0	0			0	0		

SUPPORT / DISTRESS	Group 1: In-person				Group 2: Self-report			
	n	%	Mean	SD	*n*	%	Mean	SD
FAMILY SUPPORT INVENTORY FOR WORKERS	10	100	3.03	1.03	47	100	2.61	0.61
GHQ-12	10	100	15.50	9.94	47	100	14.43	5.72
Positive case	5	50			25	46.8		
Negative case	5	50			22	53.2		

CLINICAL MEASURES	Group 1: In-person				Group 2: Self-report			
	n	%	Mean	SD	*n*	*%*	Mean	SD
HEIGHT (inches)	10	100	62.15	5.04	47	100	64.17	2.28
WEIGHT (lbs.)	10	100	199.40	44.27	47	100	176.60	57.12
WAIST CIRCUMFERENCE (inches)→ p=.009**	10	100	44.90	6.62	44	93.6	36.28	9.46
>35 – at risk	9	90			20	42.6		
<35 – appropriate	1	10			24	51.1		
BMI (lb./in^2)	10	100	36.63	8.71	47	100	30.06	9.19
Underweight	0	0			1	2.1		
Appropriate weight	1	10			23	48.9		
Overweight	1	10			4	8.5		
Obese – class I	2	20			7	14.9		
Obese – class II	3	30			4	8.5		
Extreme obesity – class III	3	30			8	17		
WAIST-TO-HEIGHT RATIO (WHtR)→p=.001**	10	100	0.73	0.11	44	93.6	0.56	0.14
> 0.5 – high: at risk	9	90			22	46.8		
≤ 0.5 – appropriate	1	10			22	46.8		

CLINICAL MEASURES	Group 1: In-person				Group 2: Self-report			
	n	%	Mean	SD	*n*	*%*	Mean	SD
NUMBER OF YEARS DIAGNOSED T2DM	10	100	5.58	5	47	100	10.12	8.85
0-5 years	6	60			21	44.7		
6-10 years	3	30			10	21.3		
11-15 years	0	0			5	10.6		
16-20 years	1	10			4	8.5		
>20 years	0	0			7	14.9		
HbA1c – 2 LEVELS	10	100			40	85.1		
> 6.9% → uncontrolled	6	60			25	53.2		
≤ 7.0% → controlled	4	40			15	31.9		
HbA1c – 3 LEVELS	10	100			40	85.1		
≤ 6.9% → controlled	4	40			11	23.4		
7.0% - 8.9% → uncontrolled	2	20			23	48.9		
≥ 9.0% → critically high	4	40			6	12.8		
HbA1c – ALL LEVELS	10	100	8.16	2.15	40	85.1	7.64	1.87

Appendix E

Exploratory T-Test Statistics Comparing In-person and Self-report Data Collection Groups on Selected Background Measures and

Occupational and Familial Stress Variables

	Group 1: In-person		Group 2: Self-report		*t*	df	*p*
	Mean	SD	Mean	SD			
Age	48.2	9.75	38.47	9.79	3.06	55	*.003
Years With Title	6.58	7.31	7.19	6.97	-.253	55	.802
Hours Worked Per Week	29.15	12.26	41.02	10.65	-3.12	55	*.003
Annual Income	2.00	1.25	4.02	1.65	-3.65	55	*.001
Home Demands Scale	3.69	0.82	3.45	0.66	1.13	55	.265
Control At Home	3.40	1.78	4.68	1.18	-2.18	10.76	*.006
Job Content Questionnaire	1.09	0.27	1.35	0.38	-2.05	55	*.045
JCQ – Psychological Subscale	3.28	0.65	3.47	0.52	-1.04	55	.303
JCQ – Physical Subscale	2.62	1.50	2.26	1.06	.892	55	.376
Assessment Of Occupational Physical Activity	2.90	1.45	2.00	1.22	2.06	55	.45
Family Support Inventory For Workers	3.03	1.03	2.61	0.61	1.24	10.36	.242
GHQ-12 (Likert System)	15.50	9.94	14.43	5.72	.33	10.30	.748
Height (inches)	62.15	5.04	64.17	2.28	-1.24	9.80	.244
Weight (lbs.)	199.40	44.27	176.60	57.12	1.19	55	.241
Waist Circumference (inches)	44.9	6.62	36.28	9.46	2.72	52	*.009
BMI (lb./in²)	36.63	8.70	30.06	9.19	2.07	55	*.043
Waist-To-Height Ratio (WHtR)	0.73	0.11	0.56	0.14	3.40	52	*.001
Number Of Years Diagnosed T2DM	5.58	5.0	10.13	8.85	-1.57	55	.123
HbA1c (ALL Levels)	8.16	2.15	7.64	1.87	.77	48	.445

[a] Annual Household Income: 3= $35,000 to $49,999; 4= $50,000 to $74,999. Home Demands Scale: higher scores mean higher home demands (scale range 1=never; 2=rarely, 3=sometimes; 4=often; 5=always); Control at Home: lower scores mean lower control at home (scale range: 1=strongly disagree; 2=moderately disagree; 3=slightly disagree; 4=slightly agree; 5=moderately agree; 6=strongly agree); For further detail see Table 8 notes. *$p<0.05$.

Appendix F

Exploratory Analysis: Group with Controlled HbA1c versus Group with Uncontrolled HbA1c

An independent-samples t-test was used to compare the means between two groups, the controlled HbA1c and uncontrolled HbA1c (Appendix F - Continued). It was used to better understand whether the selected measures differed based on group – testing whether these two groups were statistically ($p<.05$) different from each other. The variables tested were: age, education level, annual income, months with title, hours worked per week, *Home Demands*, *Control at Home*, *Job Demands*, *JCQ-27*, *JCQ-Psychological*, *JCQ-Physical*, *Assessment of Occupational Physical Activity, FSIW, GHQ-12* scores, height (inches), weight (lbs.), WC (inches), BMI, WHtR, number of years diagnosed with T2DM, and HbA1c levels.

The first analysis for the controlled versus uncontrolled groups found a significant difference in *Assessment of Occupational Physical Activity* scores, with the controlled group having higher scores (*M:* 2.68; SD: 1.46) as compared to the uncontrolled HbA1c group (*M:*1.84; SD: 1.13), t(48)=2.302, p= .026 (Appendix F - Continued). For all other remaining independent variables there was no statistical difference (<.05) between the means of the two groups. There was no statistical difference for: age, education level, annual income, months with title, hours worked per week, *Home Demands*, *Control at Home*, *Job Demands*, *JCQ-27*, *JCQ-Psychological*, *JCQ-Physical*, *FSIW, GHQ-12* scores, height (inches), weight (lbs.), WC (inches), BMI, WHtR, and number of years diagnosed with T2DM.

T-Test Statistics Comparing HbA1c (Controlled vs. Uncontrolled) Groups on Selected Measures

	Controlled HbA1c		Uncontrolled HbA1c		*t*	df	*p*
	Mean	SD	Mean	SD			
SOCIODEMOGRAPHIC							
Age	40.95	10.79	40.61	9.04	.118	48	.907
Annual Household Income	3.47	1.90	3.87	1.46	-.783	30.91	.440
HOME STRESS							
Home Demands Scale	3.42	0.73	3.57	0.55	-.849	48	.400
Control At Home	4.42	1.47	4.29	1.42	.312	48	.756
WORK STRESS							
Standard Occupation (LL vs HH)	1.16	0.38	1.23	0.43	-.573	48	.569
Months With Title	64.58	54.55	101.26	102	-1.653	47.35	.105
Hours Worked Per Week	37.95	11.59	38.18	10.76	-.071	48	.943
Job Content Questionnaire	1.35	0.36	1.28	0.41	.569	48	.572
JCQ – Psychological Subscale	3.22	0.81	2.96	0.62	1.267	48	.211
JCQ – Physical Subscale	2.47	1.16	1.96	0.99	1.684	48	.099
Assessment Of Occupational Physical Activity	2.68	1.46	1.84	1.13	2.302	48	.026*
SUPPORT							
Family Support Inventory For Workers	2.63	0.73	2.70	0.74	-.285	48	.777
DISTRESS							
GHQ-12 (Likert System)	15	7.03	13.45	6.39	.801	48	.427

Appendix F

Continued - T-Test Statistics Comparing HbA1c (Controlled vs. Uncontrolled) Groups on Selected Measures

	Controlled HbA1c		Uncontrolled HbA1c		*t*	df	*p*
	Mean	SD	Mean	SD			
CLINICAL MEASURES							
Height (inches)	63.40	3.99	63.90	2.49	-.557	48	.580
Weight (lbs.)	177.26	53	187.03	61.53	-.573	48	.569
Waist Circumference (inches)	37.06	9.78	37.86	9.35	-.280	45	.781
BMI (lb./in^2)	31.37	10.20	31.99	9.63	-.217	48	.829
Waist-To-Height Ratio (WHtR)	0.59	0.16	0.59	0.14	-.040	45	.968
Number Of Years Diagnosed T2DM	8.47	7.94	9.77	7.84	-.566	48	.574

[a] Annual Household Income: 3= $35,000 to $49,999; 4= $50,000 to $74,999. Standard Occupation Group: 1=LL; 2=HH; Home Demands Scale: ↑ scores = ↑ home demands (scale range 1-); Control at Home: ↓ scores = ↓ control at home (scale range 1-6); For further detail see Table 8 notes. *$p<0.05$.