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Health disparities and psychosocial and behavioral interventions for type 2 diabetes within Latinx communities: a systematic review

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HEALTH DISPARITIES AND PSYCHOSOCIAL AND BEHAVIORAL INTERVENTIONS FOR TYPE 2 DIABETES WITHIN LATINX COMMUNITIES: A SYSTEMATIC REVIEW

A clinical dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Psychology

by

Elisa Hernandez Guerrero Smith

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Carrie Castañeda-Sound, PhD – Dissertation Chairperson

This clinical dissertation, written by

Elisa Hernandez Guerrero Smith

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF PSYCHOLOGY

Doctoral Committee:

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DEDICATION

To my dad, thank you for your unconditional love. There are no words to begin to express my gratitude for your endless support throughout my life, and especially throughout these last few years. Hermana, thank you for being my second mother, I am forever grateful for your love, and support. Thank you for cooking my favorite homemade meals, bringing me so comfort during my times of unease.

To my husband, Tavis – I appreciate everything you do for me, and without your love, and support, I am not sure where I would be today. I will forever be grateful for your encouraging words that you gave me when I needed it most. Your support means the world to me, I love you.

To my Aunt Lisa, and Aunt Chris – my forever tutors, and angels. Thank you for always supporting and believing in me.

To my Aunt Maggie and Uncle Peter who are the reasons why I chose to complete my research on Diabetes, I love you and am forever grateful for your guidance and laughter.

A mi abuelita, Nicolasa y abuelito, Manuel. Puedo sentir su presencia todos los días.
Los extraño mucho a los dos, y no pasa un día sin que piense a ustedes.
Gracias por enseñarme a alcanzar siempre mis sueños.

And to my mother, Lupe Hernandez – life without you has been nearly unbearable.
I wish you were here to celebrate these moments with me. Thank you for always believing in me.
You will forever be my #1 cheerleader. #yayday

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Thank you, Dr. Castañeda-Sound for bringing me such warmth and tranquility in times when I needed it most. I forever offer my deepest gratitude for the guidance you have given me throughout the doctoral program and willingness to be my dissertation chair. Thank you, Dr. Tuttle Guerrero, for your helpfulness throughout this dissertation journey. Last, thank you to my research assistants for their dedication and commitment.

VITA

Education

Doctor of Psychology in Clinical Psychology **May 2022**
Pepperdine University Graduate School of Education and Psychology
Specialty Tracks: Cognitive Behavioral Therapy and Multicultural and Community interventions.

Master of Arts in Clinical Psychology **2017**
Pepperdine University Graduate School of Education and Psychology

Bachelor of Arts in Psychology **2015**
Mount St. Mary's University Los Angeles
Honor Roll

Awards and Distinctions

Pepperdine's Colleague Grant 2016-2022
Psychology Honors Society: Psi Chi 2015-Present

Clinical Experience

Doctoral Intern **8/21-Present**
Children's Institute, Inc. **Los Angeles, CA**
Primary Supervisor: Irma Ocegueda, PhD

- Conduct comprehensive intake evaluations and create client-specific treatment plans, utilizing cognitive-behavioral therapy, strength-based skills, mindfulness interventions, and trauma informed techniques to improve clients' functioning and quality of life.
- Provide weekly Spanish and English adult and child psychotherapy, including individual therapy, and family therapy across a range of modalities, to increase insight, access to resources, build coping skills, and decrease client's impairing symptomology.
- Conduct weekly PCIT sessions with families and their child to build and develop a strong parent and child relationship, helping the parent/caregiver learn additional techniques in enhancing family relationships, and reduce disruptive behaviors that the child is displaying, while also providing psychoeducation to parents, to help them better understand their child's behaviors.
- Participate in weekly PCIT supervision to increase understanding of client issues, client's attachment, family dynamic, child's behaviors, parent relationship, family disparities, dynamics of therapeutic dyad, and overall case conceptualization.
- Manage client's electronic charts by maintaining up to date progress notes, client treatment plans, addendums, and client assessments to ensure proper documentation of treatment interventions and adherence to ethical, and legal standards on Exym.
- Collaborate within a multidisciplinary team including social workers, psychiatrists, attorneys, case managers, teachers, and in-home care supports to provide continuity of care for all clients and their families.

Doctoral Practicum Extern **6/20-7-21**
Loma Linda Children's Hospital, Consultation and Liaison Services **Loma Linda, CA**
Primary Supervisor: Veronica Regueiro, PsyD
Secondary Supervisor: Ashley Hudson, PsyD

- Conduct pediatric inpatient consultation and liaison services to assess psychological, cognitive, and behavioral functioning in infants, children, and adolescents with a range of medical diagnoses (e.g., diabetes, cystic fibrosis, seizure disorder, cancer, traumatic brain injury, heart disease) and psychiatric conditions (e.g., conversion disorders, psychogenic seizures, depression, suicidal ideation, anxiety disorders).
- Provided evidence-based interventions, psychoeducation, risk assessment and crisis intervention for children, adolescents, and their families while admitted to inpatient Pediatric Intensive Care, Hematology/Oncology & Stem Cell Transplant, Bone Marrow Transplant, Acute Adolescent, and General Pediatric units.
- Collaborated with a multidisciplinary team including physicians, psychiatrists, nurses, social workers, child life services, and patient care assistants to provide patient-centered holistic care through biopsychosocial integrative framework.
- Completed medical chart review, intake interviews, and electronic medical record clinical note writing.
- Attended weekly multidisciplinary didactic seminars focused on psychiatric and medical conditions common in pediatric populations.
- Provided evidence-based psychological and cognitive rehabilitation interventions at Totally Kids Rehabilitation Hospital, an acute/subacute rehabilitation facility.
- Observed and collaborated with Dr. Jamie Pivokna-Jones in the administration of Bayley scale assessments for infant and toddler development.

Doctoral Trainee **9/20-6/21**
Encino Pepperdine Community Counseling Center **Encino, CA**
Supervisor: Anat Cohen, PhD
Supervisor: Tamara Eromo, PsyD

- Conduct comprehensive intake evaluations and create client-specific treatment plans, utilizing cognitive-behavioral therapy, psychodynamic, and mindfulness techniques tailored accordingly to each client.
- Provide weekly adult and child psychotherapy, including individual therapy across a range of modalities, to increase insight, build coping skills, and improve overall quality of life.
- Participate in weekly CBT and humanistic-existential supervision to increase understanding of client issues, dynamics of therapeutic dyad, and overall case conceptualization.
- Manage client charts and maintain up-to-date progress notes, intake summaries, and treatment summaries to ensure proper documentation of treatment interventions and adherence to ethical, and legal standards.
- Provide on-call duties, including carrying a pager and responding to clinical emergencies, as needed.
- Participate in community outreach and advocacy events to provide psychoeducation, spread awareness, and extend resources/referrals.

- Transitioned therapy services via telehealth (due to COVID-19 restrictions), reviewing HIPPA and telehealth policies, providing individual psychotherapy via telehealth video calls.

Doctoral Neuropsychology Extern **9/2019 to 6/2020**
Kaiser Permanente Psychiatry Department **Los Angeles, CA**
Supervisor: Karen Earnest, PhD

- Conducted comprehensive clinical interviews and neuropsychological assessments within the outpatient clinic.
- Served ethnically diverse patients with multiple neurological, medical, and psychiatric comorbidities including dementia (e.g., Alzheimer's, Parkinson's, and Multiple Sclerosis disease).
- Administered, scored, interpreted, and wrote integrated neuropsychological assessment reports to assess for potential cognitive deficits, diagnostic impressions, psychological functioning and to make treatment recommendations.
- Consulted with a multidisciplinary treatment team, reviewed extensive medical records, and provided feedback to patients regarding assessment results.
- Shadowed Neuropsychologists and Neurologists during WADA testing procedures to evaluate the patient's memory functioning in both hemispheres.
- Attended bi-weekly epilepsy and bi-monthly movement disorder meetings in the department of Neurology to discuss and present current patients with psychiatrists, neurosurgeons, neuropsychologists, and neurologists.

Doctoral Outreach Counselor **7/2019**
Pepperdine Immersion Program **Lima, Peru**
Supervisor: Celada-Dalton, PhD

- Joined Pepperdine's Aliento M.A. program 2-week program in providing mental health services in Lima and Cusco.
- Facilitated and provided psychoeducation community seminars.
- Participated in daily didactics with supervisor and colleagues.
- Co-facilitated group and family therapy.
- Provided mental health services in hospitals, private practices, and community centers.

Autism Spectrum Therapies **12/2017- 7/2018**
Behavioral Therapist/Interventionist **Los Angeles, CA**
Supervisor: *Elvira Kuchuryan, BCBA, MA*

- Worked with adolescents (ages 4-11) with autism and other developmental disorders.
- Conducted clinical interviews to determine overall level of functioning, symptom onset and progression, and gather other relevant information related to diagnosis.
- Provided client and family focused therapy to offer extended support and psychoeducation, for individuals and families affected by developmental disorders.
- Attend weekly individual supervision to review case notes, client's progress, and behavioral plan.

Youth Group Facilitator **1/2017-11/2018**
St. James Parish After Care Center **Los Angeles, CA**
Supervisor: Shawntres Parks, PhD, LMFT

- Facilitated and orchestrated enrichment activities based on mindfulness and the five senses. The program encouraged socio-emotional learning within the group setting as well as personal growth & development through weekly one-on-one check-ins.
- Children were taught practical skills while being mindful of their actions.
- Met with parents weekly, and teachers on an as needed basis, to discuss child's behavior and provide the parents with tools that would help them decrease behavioral concerns.
- Provide in-class mindfulness and meditation techniques to help both students and teachers improve their classroom dynamics and learning efficiency.
- Participated in weekly program development meetings to better address children's needs and enhance program services.
- Recorded children's personal, symptom, and treatment history under initial assessment procedures.

Psychology Volunteer **1/2017 to 11/2017**
Mothers Helping Others, Thrive Counseling **Los Angeles, CA**
Supervisor: Shawntres Parks, PhD, LMFT

- Under direct supervision: collaborated in group supervision and the facilitation of treatment plans for Clients in the surrounding Glendora, CA communities.
- Completed training seminars in Intersectionality, EFT couples training and Mindfulness Based Child Therapy training.

Supervisory Experience

Peer Supervisor **8/2021-Present**
Children's Institute, Inc. **Los Angeles, CA**

- Providing 1 hour/week of peer supervision to a practicum student with audio/video recording.
- Reviewing supervisees' written documentation and providing constructive feedback on clinical case notes and intake documentation, diagnoses, treatment planning, and case conceptualization.
- Receiving 1 hour/week of "supervision of supervision," discussing peer supervisory work with a licensed psychologist and other intern colleagues.
- Meeting 1hour/month with a primary supervisor of practicum students to collaborate and provide feedback on strengths and areas of growth of practicum students.

Research Experience

Pepperdine University **1/2019-Present**
Doctoral Dissertation **Los Angeles, CA**
Dissertation Chairperson: Cassandra Castañeda-Sound, PhD

- Title: "A Systematic Review on the Psychosocial and Behavioral Interventions for T2DM within the Latinx Communities."
- Completed a comprehensive search of disparities, and treatment interventions for Latinx adults that have been affected by T2DM.

- Synthesized search information into a formal systematic review to present the relevant findings, gaps in the literature, and areas for further consideration.
- Created a systematic and reproducible methodology to appraise and synthesize relevant high-quality research evidence to answer the outlined research question.
- Obtained IRB non-human subjects' approval to conduct a systematic review designed to contribute to generalizable knowledge.
- Implemented a structured methodology to identify and select relevant studies, appraised the quality of studies, and collected and analyzed data from included studies.
- Incorporated research findings to help inform the literature on Latinx disparities, and the psychosocial and behavioral interventions used to treat T2DM, along with identifying specific characteristics that were used in successful treatments.

Research Assistant **8/2013-6/2014**
Center of Behavioral and Addiction Medicine, UCLA **Los Angeles, CA**
Supervisor: *Steven Shoptaw, PhD*

- Updated records, patient and study charts, referrals, and resources.
- Organized participant, research assistant, psychologist, psychiatrist study material triage and effected filing system for raw data storage in accordance with IRB regulations.
- Controlled recruitment efforts and maintained master log databases to attract and enlist qualifying participants.
- Conducted phone interviews, screened for study eligibility, and managed scheduling of intakes and study visits.
- Oversaw patient intakes, including consent signing, documenting demographic details, recording vital signs, collecting laboratory work samples, and processed electronic directories.
- Collected and sourced articles about addiction and the interfaces with health care.
- Conducted evaluations and data for analysis.
- Assisted in aiding facility improvements by leading discussions and clinical interviews.
- Participated in administering surveys and gathering data for a grant proposal.
- Worked collaboratively within a multidisciplinary team to coordinate care that accounts for patients' sociocultural background and current context.
- Attended weekly individual psychodynamic supervision focused on case conceptualization, differential diagnoses, cultural considerations, and integrated mental health treatment.

Outreach and Education

- **Hernandez-Guerrero, E.** (October 2018). '*Anti-Bullying' Campaign,* Portola Middle School, Tarzana, CA.
- **Hernandez-Guerrero, E.** (October 2018). '*Mindfulness within the Classroom,'* St. James Parish After School Center, Pasadena, CA.
- **Hernandez-Guerrero, E.** (October 2018). '*Mindfulness at Home,'* St. James Parish After School Center, Pasadena, Ca.
- **Hernandez-Guerrero, E.** (October 2018). '*Mindfulness Breathing Techniques*,' St. James Parish After School Center, Pasadena, CA.
- **Hernandez-Guerrero, E.** (October 2018). Literature Review *'Post Traumatic Stress Disorder and the Benefits of Animal Assisted Therapy,'* Pepperdine University, Los Angeles, CA.

- **Hernandez-Guerrero, E.,** Eifert, W., Hakakian, H. (February 2020). *Middle School Anxiety Parent Training,* Portola Middle School, Tarzana, CA.

Professional Affiliations

American Psychological Association, Graduate Student Affiliate 2018-Present
- Division 1: Society for General Psychology
- Division 7: Developmental Psychology
- Division 12: Society of Clinical Psychology
- Division 40: Society for Clinical Neuropsychology
- Division 45: Society for the Psychological Study of Culture, Ethnicity, and Race
- Division 53: Society of Clinical Child and Adolescent Psychology

California Psychological Association, Graduate Student Affiliate 2018-Present

ABSTRACT

As Hispanic adults are 70% more likely than non-Hispanic White adults to be diagnosed with diabetes (Centers for Disease Control and Prevention, 2022), there is an urgent need to provide culturally appropriate care to the people with diabetes of Latinx heritage. The purpose of this systematic review is to better understand the availability and effectiveness of psychosocial and behavioral interventions for T2DM within the Latinx population. Additional focus was given to the impact of health disparities and complexities within the Latinx population that have been diagnosed with, or are at risk of, T2DM. With a greater understanding of health disparities and non-medicinal interventions, results of this study can be used to inform an appropriate approach to treatment of those affected. The researcher reviewed the relevant qualitative and quantitative literature focusing on psychosocial and behavioral interventions for T2DM within the Latinx population as well as health disparities within the Latinx adult population. The author examined more recent scholarly literature that was published in English between 2015–2021. The methodology was limited to a systematic review of the literature, and the study did not require the involvement of any human subjects. The systematic review covered peer-reviewed published research data previously collected using human participants. Results indicated various findings of Latinx health disparities, shining light on how these disparities often impact one another, causing further exacerbations of symptomology and affecting quality of well-being and overall health. The identification of Latinx health disparities and successful T2DM interventions allows for a better understanding of underlying social and economic inequities. The systematic review will also assist health care providers to prioritize interventions that have been proven to be successful, now having access to key characteristics and helpful tips and techniques to use in future research.

Chapter 1: Background and Rationale

Growing up as a young Latinx girl, it was common to share past experiences, stories of hardship, celebrations, and milestones with family members. I soon realized storytelling was the communicative technique in how my family coped and passed down values and traditions through generations. Within these stories, I learned of my families' deepest fears, struggles, strengths, and resiliencies, often being a listening ear to multiple family members who struggled with chronic illness, specifically diabetes. I observed my family members struggle in treatment management and became eager to use my platform as a researcher to inform not only my family, but the public, by identifying the effective treatments for diabetes and what to consider when working with the Latinx populations.

Statement of the Problem

The International Diabetes Federation (2003) defines diabetes mellitus as a chronic disease that occurs when the pancreas is no longer able to make insulin or when the body cannot make healthy use of the insulin it produces. It is a chronic, progressive disease that causes significant damage to quality of life and longevity. The number of individuals diagnosed with diabetes continues to increase exponentially at an alarming rate throughout the world. Just under half a billion people are living with diabetes worldwide and the number is projected to increase by 25% in 2030 and 51% in 2045 (Saeedi et al., 2019). In younger age groups, the number of individuals being diagnosed with type 2 diabetes (T2DM) is increasing worldwide, which will lead to significant public health problems, especially in the form of premature cardiovascular morbidity. In the year 2015, 30.3 million Americans, or 9.4% of the population, were diagnosed with diabetes according to data from the Centers for Disease Control and Prevention (CDC, 2017). T2DM, formerly known as maturity-onset or non-insulin-dependent diabetes, accounts for

practically all the increase. The CDC data show there are 7.2 million undiagnosed cases, equating to 23.8% of the U.S. population unknowingly suffering from diabetes. Moreover, prediabetes is a silent killer, affecting a staggering 84.1 million adults aged 18 years and over, which represents 33.9% of the adult U.S. population. Of those cases, 23.1 million are adults aged 65 years or older (CDC, 2017). Additionally, in 2022, the CDC reported 1.4 million people over the age of 10 years were diagnosed with diabetes, and more than eight in 10 adults did not know they had prediabetes.

The U.S. Census Bureau estimated that as of July 2019, the Hispanic or Latino population was the largest ethnic minority group in the United States, representing 18.3% of the total population (U.S. Census Bureau, 2019). According to the CDC's (2017) *National Diabetes Statistic Report*, Hispanics or Latinos suffer from higher rates of T2DM, obesity, and metabolic syndrome, and experience more significant multiple vascular complications than non-Hispanic Whites and Asian Americans (Caballero, 2005). The high rate of T2DM among the Latinx population is of great concern given the numerous ethnic disparities concerning access to health care and mental health care in these communities.

The essential drivers of trends in health disparities are demographic and are rooted in population structure and socioeconomic inequalities, such as difficulties in socioeconomic status (SES), discrimination, poor access to health care, and cultural stress. These factors are nonrandom and have depleted many neighborhood resources and social institutions, creating high-risk conditions for the persons residing in those areas (Vega et al., 2009). These inequalities substantially increase Latinx individuals' risk for diabetes in addition to contributing to the lack of access to adequate health care. Thus, because of these concerning issues that continue to arise within the Latinx community, it is critical to understand the factors influencing these disparities

when modifying appropriate medical and psychological interventions. The primary focus of this systematic review was on the adult Latinx population that has been diagnosed with T2DM.

Symptoms, Determinants, and Risk Factors for Diabetes

There are three main types of diabetes: type 1 diabetes, T2DM, and gestational diabetes (GDM). T2DM is more common in adults and accounts for approximately 90% of all diabetes cases. When a person has T2DM, their body does not make good use of its insulin. This primarily manifests by the body becoming resistant to the hormone insulin, which is needed to metabolize the sugar glucose, which often simultaneously impairs insulin production by the β cells of the pancreas. In contrast, type 1 diabetes is less common and inhibits the body's ability to produce insulin. The cornerstone of T2DM treatment is following a healthy lifestyle, including increased physical activity and a healthy diet. However, most people with T2DM will eventually require oral drugs or insulin to control their blood glucose levels. Several risk factors are associated with T2DM, including a family history, unhealthy diet, physical inactivity, increasing age, high blood pressure, ethnicity, impaired glucose tolerance (IGT), a history of gestational diabetes, poor nutrition during pregnancy, and obesity. People who have diabetes of either type can develop serious complications, including kidney failure, blindness, and damage to the feet and legs severe enough to require amputation (Marx, 2002). In addition, obesity is one of the main determinants of diabetes, and the CDC (2022) reported Latinos have higher rates of obesity and tend to be less physically active than are non-Hispanic Whites. Culturally, some Latinx populations see higher weight as a sign of health and prosperity instead of a health problem (Lindsay et al., 2011), which may contribute to additional risk factors in developing the disease.

Allen Spiegel, who directs the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) in Bethesda, Maryland, stated obesity is caused by "the current

overabundance of easily available food" (Marx, 2002, pp. 686–689), especially incredibly high fat and carbohydrate "fast foods," as well as portion sizes being defined in terms of "more, please." He explained that the design of the human body cannot handle this abundance of high-calorie food and is "a surprise to nature." This possibly indicates our biological digestive track may not be able to keep up with the substance of portion control and incredibly high fat, fast foods, which may cause significant long-term health issues.

Symptoms of diabetes are broad and include unexplained weight loss, fatigue, irritability, repeated infections, dry mouth, burning/itching/numbing, dark patches on the skin, blurred vision, increased thirst/urination/hunger, sores that do not heal, stroke, and erectile dysfunction. The NIDDK stated the onset of type 1 diabetes symptoms can start quickly, within weeks. Symptoms of T2DM often develop slowly over several years and can be so mild that may people fail to notice them and many people with T2DM have no initial symptoms. Thus, people may not be diagnosed with the disease until they have serious, diabetes-related health problems, such as blurred vision or heart trouble (NIDDK, 2016). As soon as these symptoms appear, it is critical that individuals be seen as soon as possible for intervention in the hope of stopping the progression of the disease.

Nearly 90% of all patients with T2DM show insulin resistance, which usually precedes the first symptoms of the disease (Zimmet et al., 2001). Moreover, insulin resistance is one component of metabolic syndrome X, including hypertension, obesity, dyslipidemia, endothelial dysfunction (as shown by signs such as microalbuminuria), and inhibited fibrinolysis, leading to a prothrombotic state (Dandona et al., 2003). However, insulin resistance is not the only cause of diabetes, and the causes of type 1 and T2DM can vary slightly.

The NIDDK (2016) stated type 1 diabetes occurs when the immune system, specifically, the body's immune system is fighting infection, which is attacking and destroying the pancreas's insulin-producing beta cells. The cause of T2DM can be traced to several factors, including lifestyle and genetics (NIDDK, 2016). The CDC and the American Diabetes Association (ADA) have reported individuals are more likely to develop diabetes if they are physically inactive, overweight, or obese. When someone is overweight, their body fat leads to insulin resistance, a condition in which the muscle, liver, and fat cells do not intake insulin well (Hardy et al., 2012). The American College of Cardiology (2013) suggested body fat location also makes a difference in which type of diabetes a person develops. Furthermore, genetics also play a large role, as specific genes can increase the risk of T2DM, especially if the person is obese.

The course of diabetes is strenuous and can affect a person's life catastrophically and in various ways. The NIDDK (2016) has stated managing blood glucose, blood pressure and cholesterol can help prevent the health problems associated with diabetes. Also, diabetic patients are strongly encouraged to increase their physical activity; avoid smoking; check their cholesterol; take their medications properly; and change their meal plans to decrease calories, saturated fats, trans fats, sugar, and salt. Preventative measures for avoiding the onset of diabetes are similar and include weight reduction, increased physical activity, and incorporating better nutritional habits into daily life (NIDDK, 2016).

Health Disparities

Why are some people healthier than others? The Office of Disease Prevention and Health Promotion stated,

> Although the term *disparities* is often interpreted to mean racial or ethnic disparities, many dimensions of disparity exist in the United States, particularly in health. If a health

> outcome is seen to a greater or lesser extent between populations, there is disparity. Race or ethnicity, sex, sexual identity, age, disability, socioeconomic status, and geographic location all contribute to an individual's ability to achieve good health. It is important to recognize the impact that social determinants have on health outcomes of specific populations. (U.S. Department of Health & Human Services, n.d., para. 1)

Powerful, complex relationships exist among health and biology, genetics, and individual behavior, as well as among health and health services, SES, the physical environment, discrimination, racism, literacy levels, and legislative policies. These factors, which influence an individual's or population's health, are known as *determinants of health* (Williams et al., 2016). The current research on health within Latinx communities indicates difficulties in acculturation, physical inactivity, dietary issues, immigration issues, discriminatory experiences, stress, and language barriers further contribute to the complexities of health disparities.

Health Disparities Within Latinx Communities. Merriam-Webster defines acculturation as a "cultural modification of an individual, group, or people by adapting to or borrowing traits from another culture" (Merriam-Webster, n.d.). A general consideration of the acculturation process is that it is to be linear and unidirectional—there is an expectation for immigrants to adopt the values, beliefs, and practices of mainstream culture (Pérez-Escamilla & Putnik, 2007). Such a linear approach virtually excludes the possibility of multiculturalism, biculturalism, and a variety of other acculturation experiences. The second problem is that researchers often base their measures of acculturation on simple static proxy indicators such as birthplace, language use, and the number of years spent in the United States. These proxy indicators (e.g., socioeconomic disadvantages, stress, discrimination, dietary intake, physical

inactivity patterns, and obesity) are unlikely to be sufficient to account for the range of health disparities observed within the Latinx culture, particularly when dealing with T2DM.

The World Health Organization (WHO; 2022a) stated physical inactivity is another significant risk factor for poor health, including the development of obesity. Thus, the *2005 Dietary Guidelines for Americans* include specific physical activity recommendations (White et al., 2011). The U.S. Census Bureau (2005) indicated that because of key cultural barriers and the poverty in which many Latinos live, there is speculation that Latinos may not have access to facilities conducive to recreational or leisure time. However, this is debatable and highly subjective. The top recommended exercise is walking, which is freely available if the neighborhood is safe. Other options include using public parks and recreation areas, including community gyms and activity centers (Crespo et al., 2000). Nonetheless, there may be social, cultural, economic, and demographic barriers to leisure time or physical activity that may put Latinx populations at a higher risk of being sedentary; furthermore, this risk may be affected by their level of acculturation (Sussner et al., 2008).

There are racial and ethnic disparities within the processes and outcomes of care in referrals and treatment plans. Moreover, providers, clinicians, and health care workers who have negative attitudes toward a certain ethnicity or race can add to the challenges Latinx patients encounter. Whether the providers are unconsciously or consciously reacting to social stereotypes, these racial/ethnic biases or outright prejudices can shape their behaviors during clinical situations, ultimately influencing their treatment decisions. Therefore, some minority individuals may delay or refuse to seek care due to a lack of trust, a perception of discrimination or prejudice, and past negative experiences in interactions with the health care system (C. Lee et al., 2009). Due to the increased risk of health disparities within the Latinx communities, these factors

are crucial challenges to overcome to improve care for Latinx, especially those who are at risk of, or have been diagnosed with, T2DM.

Organizations tasked with the prevention of diabetes in the U.S. population address healthy eating; however, it seems that these organizations may be missing the mark within Latinx communities. The Office of Disease Prevention and Health Promotion listed the *2015-2020 Dietary Guidelines for Americans*, provided from the U.S. Department of Health and Human Services and U.S. Department of Agriculture (2015) as (a) follow a healthy eating pattern across the lifespan; (b) focus on variety, nutrient density, and amount of food; (c) limit calories from added sugars and saturated fats and reduce sodium intake; (d) shift to healthier food and beverage choices; and (e) support healthy eating patterns for all. The guidelines may seem plausible to some; however, when considering food insecurity, culture-specific eating patterns and attitudes, and the disadvantages of low SES, these guidelines may be challenging for the Latinx population to follow. Food insecurity is quite common within the Latinx community. This can include disruption of food intake (of all kinds, nutritional, fast food, pre-packaged) on a regular basis due to a lack of money (Moreno et al., 2015). The U.S. Census Bureau (2005) stated 42% of households with incomes below the federal poverty level have food insecurity, and the prevalence of food insecurity among Latino households is higher than the national average at 26.9%. In addition, recent immigrants, particularly from Latin America, whether documented or undocumented, and persons of Hispanic or Latino descent in the United States are particularly vulnerable to food insecurity. This is due to factors such as a lack of access to health care, poverty, and acculturation to American behaviors (Sussner et al., 2008).

Immigrants of Latinx background face deteriorating physical and mental health that counterintuitively worsens the longer they stay in the United States (Frisbie & Song, 2003). For

example, the risk of developing T2DM increases as immigrants acculturate and adopt American diets and have limited exercise habits. Therefore, improving disease surveillance, such as, initiating focused research efforts, and increasing health care access are essential strategies for tackling this growing problem (Markides et al., 1997; Palloni & Morenoff, 2001; Pawson et al., 1991).

Discrimination. Discrimination related to mental health care is also a serious issue among Latinx populations. Fifteen percent of California adults reported discrimination during a health care visit, and 4% specifically during mental health/substance abuse visits (Mays et al., 2017). Latinos, the uninsured, and those with past-year mental disorders were twice as likely as others to report health care discrimination. Experiences of discrimination in mental health/substance abuse visits were associated with less helpful treatment ratings for Latinos (Mays et al., 2017). These incidents can cause Latinx patients to feel judged and misunderstood, causing them to circumvent health care visits and end treatment early.

According to a Robert Wood Johnson Foundation (2008) survey, the language barrier is a primary factor for Spanish speakers who do not use health care. Approximately 13 million Hispanics in the United States barely speak English and do not speak English in the home. Literacy issues, along with high levels of poverty and education challenges, present hurdles to receiving adequate knowledge regarding diabetes care for the Latinx community. When considering populations that have low literacy or limited English, it is vital to provide tailored educational materials with illustrated graphics and to use “teach back” methods to confirm the patient’s understanding (Dinh et al., 2016). Ultimately, it is critical to ensure there is effective communication between all health care providers and patients.

Diabetes and the Latinx Population

Some research has shown access to reliable transportation, stigma, acculturation, social support, SES, lack of education, and access to health care are all factors to consider in the treatment of Latinx dealing with diabetes (Burner et al., 2019). In addition, ethnicity, acculturation, citizenship, residence, education, SES, genetics, biology, behavior, psychology, society, and environmental factors can all determine the influence of human health within Latinx communities.

As discussed above, acculturation is a complex, multidimensional issue. Its dimensions include behaviors, attitudes, norms, and values. An individual's level of acculturation goes well beyond language use and preference, may not be constant across dimensions, and may differ across various settings (e.g., home, work, and social environments). Differences in health-related outcomes have been found to be related to acculturation but confounds may be SES, age, and movement from urban to rural areas (Finch & Vega, 2003). A determination of how acculturation might influence the effectiveness of culturally adapted interventions should be a standard part of the adaptation process. This type of analysis is particularly critical for treatments that involve fundamental cultural elements such as food, methods of food preparation, and physical activity norms (Barrera et al., 2012). Understanding acculturation within Latinx communities can help create a more cohesive and culturally appropriate approach to developing treatment plans and considering preventative measures for Latinx patients.

In implementing diabetes interventions within the Latinx population, it is also important to consider treatment compliance. When proposing a specific treatment regimen for Latinx communities, professionals must consider customs, traditions, values, and possible mental health stigmas. Some common elements of the Latino culture may be a viable mechanism to improve

treatment adherence. For example, some Latinx cultural customs include *familismo*, *respeto*, *personalismo*, *espiritism*, *simpatia*, and *fatalismo*. Familismo is recognizing the importance of family, prioritizing the family's needs and wants before the individual, showing dedication, commitment, and loyalty to the family. Respecto is another value that displays respect, obedience, not interrupting or arguing with others. Personalismo is a Latinx value where a person should be warm, caring, and trusting while socializing with others. Espiritism is the belief that good and evil spirits exist and can affect well-being. Simpatia often means being polite, friendly, and agreeable, not causing disturbances with others. Last, fatalism tends to mean that fate is inevitable, and the efforts put into one's health to improve well-being and health are futile. Thus, it is essential health care providers consider the cultural customs in treatments and further examine how these customs relate to acculturation.

Furthermore, another Latinx health disparity is low health literacy. As mentioned before, the Latinx population more commonly speaks Spanish than English, which further causes difficulties in Latinx individuals' ability to obtain, process, and understand basic health information needed for appropriate health considerations if treatment is not appropriately translated. There is an increase in the recognition of health literacy as an essential factor in patient compliance, cancer screening utilization, and chronic disease outcomes (Shaw et al., 2009). The American Medical Association and other organizations have prioritized low health literacy among patients in working with underrepresented populations, further assessing additional resources to implement in treatment to improve comprehension and retention. Limited comprehension and failed communication caused by low health literacy combine negatively with cultural beliefs and socioeconomic factors, contribute to failures in the patient's ability to understand and engage with physicians and treatment plans (Syed et al., 2013).

Finally, when working with Latinx populations, culturally responsive interventions are essential to consider. Interventions can include training courses for patients with diabetes, along with community outreach presentations. In addition, practical skills development, family/peer network engagement, empowerment techniques, and consideration of access to bilingual providers are treatment options for Latinx populations.

Interventions

Although there is no cure for T2DM, several factors can assist in managing the disease. These include losing weight, eating well, exercising, managing blood sugar, to name a few. A major task for diabetes care providers is to support patients in performing necessary self-care behaviors using well-accepted strategies such as recommending effective self-care regimens and educating patients in their use. In addition, behavioral interventions that help patients implement self-care regimens, specifically creating individualized and personalized techniques, can be most beneficial to consider personal daily challenges. As mentioned before, it is critical for an individual to seek immediate treatment after recognizing early onset of symptoms, in addition to receiving a recent diagnosis of T2SM, as poor management of disease can lead to extreme consequences and fatalities.

Interventions for Latinx. The CDC (2022) stated U.S. adults overall have a 40% chance of developing T2DM, but if a person is a Hispanic/Latino American adult, their chance is more than 50% and they are likely to develop the condition at a younger age. Diabetes complications also hit harder in this population, as Hispanics/Latinos have higher rates of kidney failure caused by diabetes as well as diabetes-related vision loss (CDC, 2022). People with diabetes may experience long-term complications that develop gradually and can eventually become disabling and life threatening. Persons who have T2DM can develop heart and blood vessel disease, nerve

damage, kidney damage, eye damage, slow healing, hearing impairment, skin conditions, sleep apnea, and Alzheimer's disease. Many psychosocial and behavioral interventions are available to assist in the management of T2DM for Latinx. Specifically, understanding the personal, family, and community context of living with diabetes and choosing interventions that provide support and coping strategies for self-management have important implications for reducing health disparities among disadvantaged racial and ethnic groups (Whittemore, 2007).

Psychosocial/Behavioral Interventions. Hyperglycemia is the hallmark of diabetes. Living with T2DM entails experiencing transient, or sometimes chronic, symptoms of hyperglycemia and its complications (Wagner et al., 2018). The presence and severity of symptoms of hyperglycemia are associated with increased levels of negative affect, including symptoms of panic (Ludman et al., 2004), anxiety, and depression (Paddison et al., 2011). Living with T2DM also entails difficulties, including the need to engage in a complex routine of self-management behaviors, disruption of daily routine, potentially uncomfortable social situations, aversive health care interactions, and navigating an often-confusing health care environment (Wagner et al., 2018). Moreover, individuals most at risk for diabetes (i.e., racial and ethnic minorities and those from low socioeconomic backgrounds) have experiences that may increase their risk for psychological distress. Thus, psychological distress is common in persons with diabetes but remains only partially understood (Wagner et al., 2018) and further research is needed.

There is evidence that interventions aimed at stress management and relaxation are efficacious for reducing the overall levels of distress associated with chronic conditions and their symptoms (e.g., Duncan et al., 2012; Hall et al., 2017; van Son et al., 2013). However, little research has directly examined whether such interventions dampen concurrent emotional

reactions to spikes in symptom levels in everyday life (i.e., one of the implied mechanisms underlying such techniques; Wagner et al., 2018). Thus, it is critical to continue conducting research to better understand how stress management and relaxation tools can aid in reducing the stress related to chronic conditions.

Health education that is learner centered and respectful of cultural/linguistic needs has been shown to have the greatest impact on improving knowledge scores and clinical T2DM outcomes in socially disadvantaged populations (American Association of Diabetes Educators, 2007; Glazier et al., 2006; Hawthorne et al., 2010; Rosal et al., 2011; Sarkisian et al., 2003). In these populations, intervention features, including cultural and health literacy targeting, empowering approaches, and attention to social contextual issues (i.e., social support from family and friends), have been shown to improve diabetes self-management (Carbone et al., 2007; Glazier et al., 2006; Lynch et al., 2011).

Health promotion programs for patients with T2DM focus on teaching participants health-promoting behaviors (i.e., healthy eating and physical activity behaviors), cognitive-behavior skills and strategies to facilitate health-promoting behaviors, and strategies to promote positive interactions between participants and their health care providers. The singular goal of this program was to empower participants with T2DM to lead a healthier life (Tol et al., 2015). There are several considerations to keep in mind when incorporating health-promoting behaviors within Latinx diabetes treatment (Antshel, 2002), such as a healthy diet, adequate sleep, avoiding tobacco, reduced alcohol intake, and regular physical activity.

Social cognitive theory emphasizes that people learn best from role models whose behavior they wish to emulate (Bandura, 2001); thus, this theory can be applied in telenovelas interventions using culturally sensitive characters and situations to strengthen the salience of the

representations of Latinx culture to improve insight on diabetes-related attitudes, beliefs, and behaviors. Using deep-structure adaptations in telenovelas through extensive formative work, allowing for the representation of health-related issues in the context of broader social or cultural values and characteristics of Hispanics aid in developing storylines, where la familia was the central focus of the barriers and facilitators to diabetes management (Sohal et al., 2015). Health promoting workshops have frequently used diabetes interventions. Furthermore, these workshops can consist of a variety of interventions (Tucker et al., 2014), such as (a) didactic presentations by research team members, community leaders, nutritionists, and nurses to teach participants health-promoting behaviors (e.g., healthy eating and physical activity behaviors) and how to use self-praise to sustain these behaviors; (b) demonstrations by a nutritionist on how to read and understand nutrition labels; (c) demonstrations on how to shop for and prepare desired culture-linked meals in a healthier way without sacrificing taste; and (d) small group sessions with psychologists and psychology graduate students in which the research team members and participants shared practical and culturally sensitive strategies for engaging in health promoting behaviors and overcoming disparities to engaging in health promoting behaviors and strategies for reducing stress and depression—emotions that are often contributors to and consequences of unhealthy eating and inactivity (Tucker et al., 2014). As it is not common to see culturally sensitive interventions, providers should consider using patients' values, interests, customs, and strength-based approaches within treatment.

Within the Latinx culture, family is an important value as is prayer. Prayer is central to the concept of spirituality. Religious involvement can affect physical symptoms, quality of life, and willingness to receive treatment (B. Y. Lee & Newberg, 2005). "Thus, the health-care practitioner, who is aware of the client's religious practices and spiritual needs, is in a better

position to promote culturally competent health care" (Purnell & Paulanka, 2003, p. 33). The influence of Roman Catholicism can be seen today in many Mexican American families where religion is embedded in their daily lives (McFarland & Wehbe-Alamah, 2019). For example, many family homes have altars with a statue of the Virgin Guadalupe, pictures of saints, and lit candles. These altars are often the focal points of the home (Spector, 2002). These are important factors to consider, as Latinx populations can benefit from implementing their faith and strengths into their treatment plans.

Feasible and accessible lifestyle modifications in diet and physical activity are the foundation of the management of diabetes and metabolic syndrome. Metabolic syndrome is when a cluster of conditions occur together, increasing the risk of additional medical complications. Diet plays an essential role in regulating blood glucose control in diabetes; an inadequate diet is a commonly identified problem of diabetes. Research has indicated several disparities exist to adherence to a diabetic prudent diet (Glasgow et al., 1997, as cited in Wen et al., 2004). For example, low SES, and no access to health care can further contribute to food insecurity, and lack of diabetic knowledge. Disparities to self-care refer to the environmental and cognitive factors that interfere with following the recommended treatment regimen. For older adults, family support may be important in overcoming disparities to self-care. Self-management behaviors in diabetes are associated with the patient's characteristics within their family environment. Among Hispanics, the extended family is considered a primary support group (Anderson & Halter, 1989, as cited in Wen et al., 2004). Therefore, it is especially important to consider involving immediate and extended family members within the treatment process to provide additional support, and treatment compliance.

Though the exact dose of physical activity for the prevention of T2DM is unknown, data show increased physical inactivity and sedentary behavior perpetuate the incidence of T2DM and other obesity-related chronic diseases (Frediani et al., 2020). Thus, it is important to also consider jobs and daily tasks; for example, having a desk job that includes sitting for the majority of the day may be a risk factor in comparison to someone who delivers packages, as this job includes walking and carrying heavier objects. There is significant evidence to support that even moderate amounts of weekly physical activity decrease the risk of T2DM onset (Yang et al., 2017, as cited in Frediani et al., 2020). The U.S. National Diabetes Prevention Program (NDPP) implements an evidence-based model to help pre-diabetic individuals navigate the process of engaging in sustainable lifestyle changes, including diet and physical activity improvements and a 5%–7% weight loss goal (Frediani et al., 2020).

Problem solving can also be considered a core skill for patient diabetes self-management education (Fitzpatrick et al., 2013). Day-to-day management of diabetes is primarily in the hands of the patient (Fisher et al., 2007); therefore, patients require education and skills training to perform diabetes self-management. The American Association of Diabetes Educators (AADE) named seven self-management behaviors everyone with diabetes must learn and master: (a) blood glucose self-monitoring, (b) taking medications, (c) healthy eating, (d) being active, (e) reducing risks, (f) healthy coping, and (g) problem solving (Mulcahy et al., 2003). Problem solving is a cognitive-behavioral process by which a person attempts to identify effective and adaptive solutions for specific problems encountered in everyday life (D'Zurilla, 2006; Fitzpatrick et al., 2013). Problem solving facilitates the enactment of each of the other self-management behaviors. In behavioral science, problem solving has been shown to be a

longstanding, effective, therapeutic intervention approach for behavior change (D'Zurilla, 2006); however, its application to diabetes self-management is more recent (Schumann et al., 2011).

If T2DM lifestyle modification alone has failed, patients with newly diagnosed T2DM are generally treated with up to two oral antidiabetic agents (Caballero, 2005). For patients who fail to achieve adequate glycemic control while receiving combination therapy with two oral antidiabetics, the next step is usually the addition of a third oral agent or the initiation of insulin therapy (Caballero, 2005). Over time, treatment with oral antidiabetics alone often becomes ineffective and most patients eventually require insulin therapy (Caballero, 2005). Insulin therapy is used to keep patients' blood sugar levels within a target range, as insulin is injected in the fat under the patient's skin using a syringe.

Medication management is also important to consider when working with the Latinx population coping with T2DM. Although there are many factors that affect glycemic control, adherence, defined as the extent to which patients follow the instructions given for prescribed treatments, has been consistently shown to improve control (Parada et al., 2012). Moreover, noncompliance is associated with significant negative health outcomes; for example, it can lead to unhealthy cholesterol levels, increased all-cause hospitalizations, and increased mortality (Parada et al., 2012). Despite awareness of the importance of medication adherence, compliance rates vary widely.

Effective Interventions. When considering the management of diabetes, providers should consider approaches that are community-based, are culturally sensitive, promote cultural humility, and emphasize a sense of self-efficacy and empowerment. Family-based interventions are strongly encouraged within treatment as family-focused interventions incorporate cultural

values (familismo) in facilitating stress management, problem solving, and confidence in diabetes self-management.

Multiple studies have shown that familiarity with the culture, such as by involving community members, using similar food recipes, using familiar terminology, engaging in narrative therapy, building rapport, and using psychoeducation as a focal point, is essential when working with Latinx populations. For example, group dancing for physical exercise in a selected community setting with diverse music reflective of group members' different cultural backgrounds can be more intriguing to Latinx populations as it considers the community values and interests.

In addition, there is a T2DM management intervention called *Sugar, Heart, and Life: A Guide to Living with Diabetes* (Magaziner, 2013) that includes an interactive telenovela and user-friendly computer-based collateral learning modules and games. This intervention was implemented among Hispanic T2DM patients within a safety net health care system and was shown to be successful in helping the Latinx population manage their diabetes. For example, in Hispanic populations, the importance of family (*la familia*) in the management of diabetes was emphasized in a number of studies (e.g., Ramal et al., 2017; Thackeray et al., 2004). Simply put, it is not enough to depict characters who struggle with diabetes management; narratives must depict characters who struggle in the same way as the viewer—and this struggle will be different depending on cultural norms and values. The study focused on deep structure narratives, making sure authors considered cultural factors when creating their storylines.

The health self-empowerment theory has also been used in several studies, acknowledging the importance of self-efficacy, self-empowerment, and the values of the Latinx community. The theory of health empowerment is based, in part, on Rogers's science of unitary

human beings (Shearer, 2009). The theory indicates health empowerment emerges from a synthesis of personal resources and social-contextual resources (Shearer, 2009). Empowerment from this perspective is a dynamic health process that emphasizes "purposefully participating in a process of changing oneself and one's environment, recognizing patterns, and engaging inner resources for well-being" (Shearer & Reed, 2004, as cited in Shearer, 2009, pp. 253–259). Health empowerment emphasizes facilitating awareness of the ability to participate knowingly in health and health care decisions. This, too, can be helpful in diabetes management within the Latinx communities.

Culturally sensitive health care is responsive to the values, beliefs, and practices of individuals who share a common cultural and linguistic heritage or other identifying characteristics such as religion, race, or SES (Tucker et al., 2014). Other researchers have defined culturally sensitive health care as care that conveys knowledge, awareness, experience, and skills to serve culturally diverse patients and conveys these competencies in ways that enable patients to feel comfortable with, trusting of, and respected by their health providers (Tucker et al., 2007). Using the Motivators of and Barriers to Health-Smart Behaviors Inventory can also be helpful when considering motivation and barriers and disparities to engaging in health-promoting behaviors. This inventory consists of statements that assess participants' self-reported motivators of and disparities to the following health-promoting behaviors: eating a healthy breakfast, eating healthy foods and snacks, drinking water and low/no sugar beverages, and engaging in physical activity daily for exercise. Participants rate their agreement on these items using a 4-point Likert scale. Questionnaires were used to help participants recognize their top motivators of and barriers to these behaviors (Tucker et al., 2014). This inventory can help providers better

understand the possible disparities their patients are facing so they can assist in minimizing those disparities, if possible.

COVID-19 Pandemic

Although research has identified some effective interventions for T2DM among Latinx populations, it appears that there continues to be a lapse in understanding Latinx disparities and barriers, such as accessibility, quality, and language. As a result, the Latinx community continues to struggle in seeking treatment and treatment compliance, further compounding health equity and Latinx comorbidities. For example, the ongoing global pandemic, COVID-19, has ravished the Latinx community, a community that continues to be at high risk due to various preexisting comorbidities that can be exacerbated by COVID-19, resulting in high fatalities and health complications.

As of March 18, 2022, the WHO (2022b) has reported 6,062,536 confirmed COVID-19 deaths across the globe. Statista (2022), a known global digital database, reported that as of March 13, 2022, there were around 965,000 deaths among the 79 million reported positive cases of COVID-19 within the United States. The ongoing global pandemic has not only taken a vast number of lives regardless of people's backgrounds, but data have now shown the pandemic has exposed pre-existing disparities among several vulnerable populations.

According to the U.S. Census Bureau (2019), there are 60.5 million Hispanics living in the United States, representing 18.4% of the total U.S. population. CDC (2022) data show that as of March 16, 2022, 16.2% of U.S. COVID-19 deaths were among the Latinx population. As the Latinx population has various identified disparities that are mentioned within this systematic review, it is important to recognize that further research is needed to explore the relationship between COVID-19 and health disparities within Latinx populations. Some research studies have

shown Latinx people who have coexisting medical conditions, issues with accessing health care, difficulties in immigration status, and literacy issues in addition to poor work conditions may have a significantly higher risk of COVID-19 in addition to having poor prognosis outcomes.

Rationale, Research Aims, and Research Questions

This systematic review involved analyzing the effective psychosocial and behavioral interventions for T2DM within Latinx communities. A greater understanding of the effectiveness of interventions within Latinx communities coping with T2DM could potentially inform clinicians, counselors, physicians, and patients. There is a significant amount of research exploring treatment options for T2DM; however, continued research is needed specifically on effective interventions with Latinx populations. This systematic review aided in better understanding the profusion of health disparities within Latinx populations. This in-depth analysis was intended to shine light on effective interventions used for Latinx patients coping with T2DM and how current interventions can be modified in the future to address health disparities and diversity issues.

The specific research questions that guided this study were:

1. What are the health disparities within the Latinx communities?
2. What types of psychosocial and behavioral interventions are being conducted for T2DM for the Latinx population?
3. What are the characteristics or specific techniques of helpful T2DM interventions within the Latinx population?

Chapter 2: Methodology

Systematic Review Methodology

The researcher in this study conducted a systematic review of qualitative and quantitative studies to evaluate the health disparities and psychosocial and behavioral interventions for T2DM among the Latinx population. As the specific review approach was a narrative summary, the principal researcher succinctly summarized and categorized the main findings within the data of each study. The researcher used narrative summary, which provides dialogue between the reader and researcher, as it summarizes and presents a story in chronological order, possibly delivering knowledge to the recipient in a more traditional manner. This helped not only to synthesize the most recent psychosocial and behavioral interventions and shine light on the health disparities Latinx communities encounter, but can help the reader recognize important cultural aspects to consider when working with the Latinx population and make informed decisions about whether interventions could be an appropriate treatment modality for their patients based on many multifactorial considerations (e.g., access to reliable transportation, low literacy, immigration, possible stigma, level of acculturation, lack of social support, low SES, lack of education, access to health care, predisposition/genetics, discrimination, proof of residence, and environmental factors). The researcher used a PRISMA checklist (See Figure 1) as a general guide to the systematic review process.

Eligibility Criteria

The researcher considered qualitative and quantitative studies focused on assessing and evaluating Latinx disparities and the psychosocial and behavioral interventions for T2DM for the review. The inclusion and exclusion criteria for the systematic review were developed based on the research questions and the extensive literature review presented previously. Study design

criteria included any quantitative and qualitative methodologies such as cross-sectional, correlational, descriptive, case-control, and experimental designs (randomized control trials, and quasi-experimental design with or without control groups). Only studies published within the United States were considered within this review.

This review included English-language studies due to the additional reviewers' linguistic limitations. All articles were peer-reviewed scholarly articles published from 2015 to 2021 that examined health disparities and psychosocial and behavioral health interventions related to the diagnosis of T2DM among the Latinx population. All behavioral and psychosocial interventions were considered for prevention and treatment of T2DM. The impact of treatment included effects on symptoms; emotional, social, and cognitive functioning; or other self-identified reports. The samples of the included studies needed to be composed of Latinx male and female adults. The definition of an adult was 18 years and older. There were no restrictions on gender, literacy levels of participants, education level, or SES.

While researching the existing literature on health disparities and the psychosocial and behavioral interventions for T2DM within Latinx communities, the researcher decided to focus on the last 7 years of research to include the most recent data, to stay informed with current research findings, and recognize recent successful trends in Latinx interventions and outcomes. Thus, the researcher gathered literature for this systematic review that was published from 2015 to 2021, and reviewed all studies that met the criteria.

Search, Screening, and Selection Processes

Information Sources

During preliminary searches, the principal researcher identified a wide array of literature; thus, after collaboration with the university's librarian, the principal researcher decided to only

use the following search engine: EBSCOhost: PsycINFO. PsycINFO is an American Psychological Association resource for abstracts of scholarly research and is the largest resource devoted to peer-reviewed literature in behavioral science and mental health. The database contains over five million records and summaries. The researcher used a preliminary set of keywords identified through a preliminary review of the literature to find potentially relevant studies (see Appendix A for preliminary search terms). No other search strategies were used, such as targeting journals that publish frequently on this topic.

Search Terms

The primary concepts within the review were diabetes type 2, Latinx, health disparities, and psychosocial/behavioral interventions. The researcher developed initial set of terms was collected based on preliminary feasibility searches of the literature. These terms included "Latinx" OR "Hispanics" OR "Chicanos" OR "Latinas" OR "Mexican" OR "Latino"; "T2DM" OR "T2DM mellitus" OR "T2DM" OR "T2M" OR "NIDDM" OR "non-insulin dependent diabetes mellitus"; "interventions" OR "strategies" OR "best practices" OR "treatment" OR "therapy" OR "program" OR "management" OR "care"; "disparities" OR "disparity" OR "inequities" OR "inequality" OR "bias" OR "disproportionality"; and "therapy" OR "treatment" OR "intervention" OR "counseling" OR "psychotherapy." The researcher discussed and created the Boolean search term with the Pepperdine University librarian.

Selection of Studies

Preliminary searches showed some electronic database search engines did not offer the option to search by United States; therefore, the researcher reviewed and assessed every article for the inclusion and exclusion criteria before engaging in the data extraction and quality

appraisal processes. The researcher used a detailed search plan and documentation spreadsheet for outlining the complete set of electronic search strategies in this review.

After the search process was completed, the researcher reviewed each result using the inclusion and exclusion criteria. First, the researcher reviewed and screened the title and abstract of each article to determine whether the target research variables were included; specifically, to determine whether the article included the Latinx population, and the treatment of T2DM. Next, the researcher read and screened the full article for all inclusion and exclusion criteria to determine whether the article was eligible for the current study. A confirmatory review of randomly selected articles was completed by the principal researcher to approve included/selected literature. The researcher used the Screening and Selection Record Excel spreadsheet to keep track of all articles that were obtained in the search process and then reviewed during the screening process (See Appendix B). In the final column of this spreadsheet, the primary and secondary reviewers indicated the final decision to include or exclude the article.

The PRISMA Flow Diagram (See Figure 1) depicts the flow of sources from one phase of the systematic review to the next. It begins with the total number of sources or records identified through the database searches, and then the total number of sources after searching through and removing duplicates. Next, it displays the number of articles that were screened via title and abstract for relevance to the current study and the number that were excluded in that process. It then shows the number of sources where the full text was assessed for eligibility using the search and screening document, followed by the number of articles that were excluded in that process accompanied by the reason for their exclusion. Finally, it ends with the total number of qualitative and quantitative studies included in the systematic review.

Data Collection and Extraction

Data Collection

Data collection involved conducting a detailed review of each selected study to identify relevant information for extraction and categorization. The systematic review variables were identified based on data that assisted in answering the research questions. Information coded included information about the study (date form completed, initials/ID of person extracting data, title, source/publication type, publication status, document language, intervention used, intervention characteristics), general methodology (features; aim of study, design, type of method, research approach), assessment of research variables, study participant characteristics/population (population of interest, recruitment methods, sample size, age, gender, race/ethnicity, T2DM, Latinx, comorbidity, other treatment received), setting characteristics (hospital, mental health community, clinic, school), data collection settings, analyses conducted (descriptive, inferential, and qualitative), results (summary of results, outcome, points of time for measures, validity of tools, effectiveness), and conclusion/follow up (key conclusion of study, author recommendations, did the study answer the systematic review questions, takeaways, and limitations). When articles were reviewed that had encapsulated the "Latinx" term with other populations, for example, "ethnic minorities," the researcher continued the screening process and made sure all participants were of Hispanic descent. In addition, the researcher screened for intervention type, other characteristics of the disease/comorbidity, and possible disparities. Within the data extraction form, identification of the variables included the following: V1–T2DM, V2–T2DM mellitus, V3–T2DM, V4–T2D, V5–NIDDM, V6–non-insulin dependent, V7–diabetes mellitus, V8–Latinx, V9–Latino, V10–Hispanic, V11–ethnic minorities, V12–Chicanos, V13–Mexican, V14–Latin*, V15–adult population, V16–interventions, V17–

strategies, V18–best practices, V19–treatment, V20–therapy, V21–program, V22–management, V23–care, V24–approaches, V25–psychosocial, V26–behavioral, V27–disparities, V28–inequalities, V29–inequality, V30–bias, V31–disproportionality, V32–determinants, V33–social determinants, and V345–health disparities. However, the researcher also grouped variables together in the appropriate categories.

Data Extraction

The researcher used a Data Collection and Extraction Form to track extracted data for each study (See Appendix C). The university's program research coordinator developed the base form, which the principal researcher modified to include all variables relevant to the current study. Variables that were extracted were determined in the context of the focus of this systematic review.

The final form included the previously identified document ID number, the names of authors, year of publication, full document title, research variables, and a section for notes—the remaining portion of the form was divided into nine sections: general information, design characteristics, methodological features, assessment of research variables, study participant characteristics and recruitment, setting characteristics, analysis conducted, results, and conclusion and follow up. The assessment of the variables was as follows: V1–T2DM, V2–Latinx population, V3–adult population (18 and older), V4–interventions, and V5–health disparities. In addition to the eight sections within the data collection and extraction form, the principal researcher added a ninth section to evaluate intervention characteristics. Within this ninth section, the researcher considered the following: (a) outcome of the source, (b) design quality, and (c) effectiveness.

The researcher and two research assistants divided up the 23 included studies and completed data extraction for their assigned articles independently. The principal researcher and research assistants independently extracted data using the same data extraction form and compared the results for discrepancies. The principal researcher also conducted data extraction for a random sample of the studies and then compared the results to what the research assistants had already done to make sure they were categorized appropriately. Once all studies were reviewed, the extracted data from each form were transferred to an Excel spreadsheet. Any need for modification was determined collaboratively and decided by the principal researcher.

Quality Appraisal

After the principal researcher and additional research assistants completed the data extraction process, a critical appraisal for each study occurred to determine the quality of the publication and the study's methodology; to reduce bias and mistakes, a confirmatory review of a randomly selected number of articles by the research chair or other designated person occurred. The principal researcher and additional research assistants assessed the quality of the chosen studies using a Quality Appraisal Form (See Appendix D). More specifically, the form included a review of the following nine criteria: (a) strength of literature foundation and rationale for the study, (b) clarity of research design or methodological approach, (c) quality of research design or methodological approach, (d) sample selection and characteristics, (e) measures/data collection tools, (f) data collection, (g) analysis of data, (h) discussion of study limitations, and (i) consideration of culture and diversity. Each of the outlined criteria were ranked as follows: 3 (*Strong*), 2 (*Good/Adequate*), 1 (*Weak*), and 0 (*Missing*). A cut off score of 19 was implemented within the quality appraisal process to increase the quality of extracted studies. The critical appraisal occurred immediately after the completion of the data extraction of the studies selected

for inclusion. The reviewers completed a critical appraisal form for each of the studies and had different rankings on a domain or the overall quality of the study; there was an establishment of collaboration for a common consensus. If there was not an establishment of a common consensus, the principal researcher determined the quality of study.

The Quality Appraisal Form was designed by the university's program research coordinator and modified by the researcher. The researcher evaluated each selected article with the Quality Appraisal Form to determine the overall quality of the literature used within the systematic review. After the principal researcher and research assistants completed each study's Quality Appraisal Form, there was a transfer of ratings and comments to the Excel database spreadsheet. As there were many articles that needed to be appraised, the principal researcher and chair decided it was best to implement a quality appraisal cut off score of 19 to improve overall guideline standards, further improving quality of summed articles included within this systematic review.

Data Management, Synthesis, and Analysis

Database Development and Reporting of the Results

After identifying the final set of articles for inclusion, the researcher extracted data from each article using the Data Extraction and Quality Appraisal Form. The raw data collected from each form were then entered into an Excel sheet Database Table (Appendix E) designed by the university's program research coordinator and modified by the principal researcher. The data were entered into the Database Table by the principal researcher and research assistants. The Database Table was composed of the research variables and categories described in the data extraction and quality appraisal forms above. The principal researcher organized the collected data into categories based on the extracted descriptive and analytical data.

Following the completion of the Database Table, the collected data were cleaned, organized, and presented in three data tables. During the cleaning process, data were categorized and put into a consistent format. The tables were used as the evidence base for the research questions. Table 1 (Disparities), Table 2 (Psychosocial and behavioral interventions), and Table 3 (Characteristics of successful interventions) present all the information relevant to answering the research questions. A review of the above was assessed and examined and the results were presented descriptively.

The results of the systematic review were transferred from the Database Table and are summarized in Appendix F (Table of all Included Studies), which was designed by the university's program research coordinator and modified by the principal researcher. This table also presents key characteristics of the included articles, including document ID number, author, year, study design, type of intervention, identified disparity, characteristics of successful interventions, and sample characteristics (i.e., Hispanic origin, location, sample size, age, and gender).

Data Analysis and Synthesis

After the data were extracted, the quality appraisals were completed, and the raw data were transferred and entered into their respective tables. The findings from the systematic review of quantitative and qualitative studies were described and analyzed with a narrative synthesis. The analysis involved identifying, organizing, and describing various patterns, themes/characteristics in the articles reviewed. This information was then analyzed and conceptualized for potential relationships between the Latinx disparities, Latinx psychosocial and behavioral interventions, and the characteristics of successful interventions. In addition,

research variables, outcomes, selected measures, and findings were reviewed and examined for patterns. A descriptive overview was constructed to present the key findings.

Chapter 3: Results

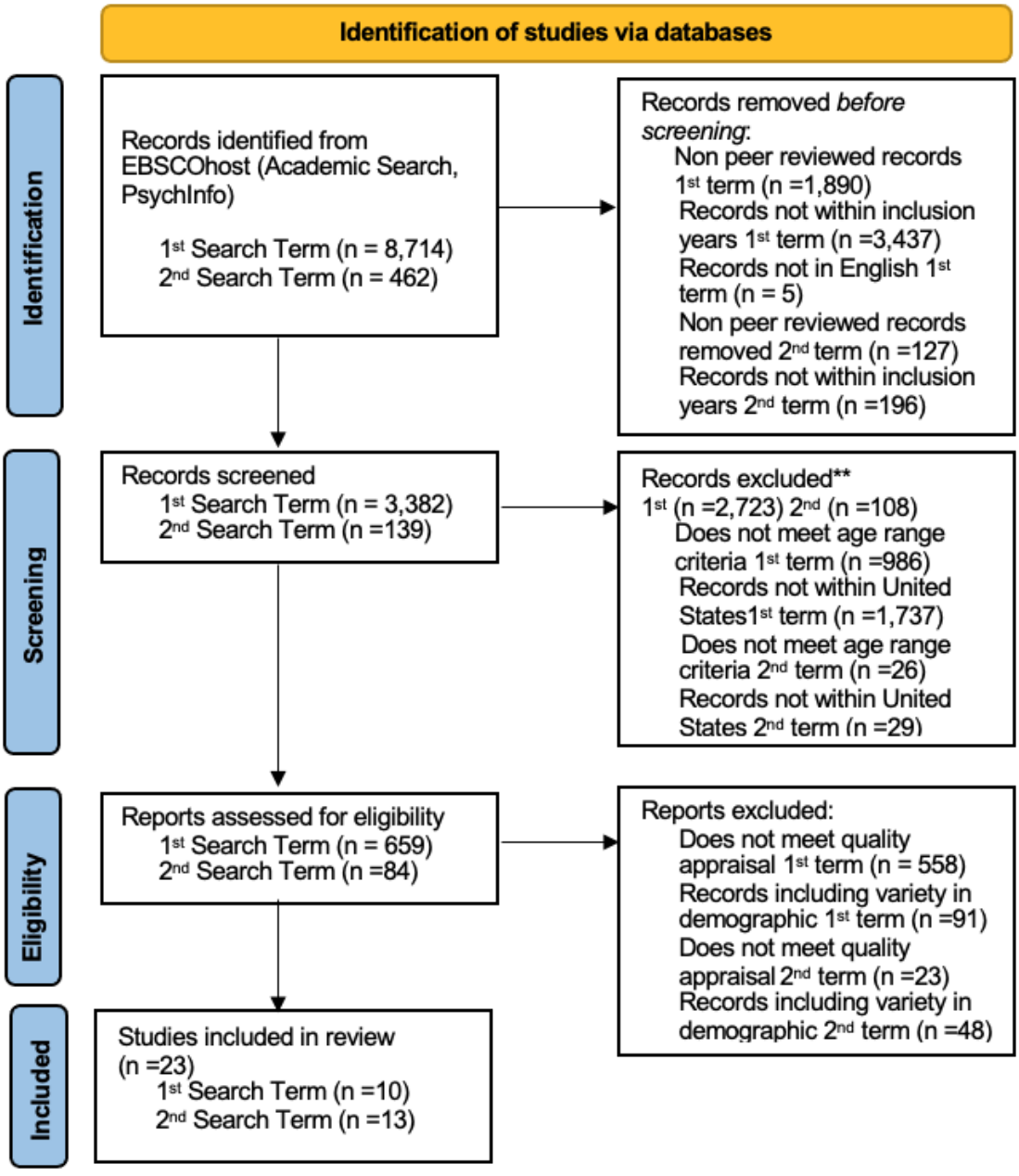
Search Results

The first search yielded 8,714 results (EBSCOhost: Academic Search, PsycInfo). All articles were screened for eligibility using the inclusion and exclusion criteria. Once articles were determined to be peer-reviewed (*N* = 6,824), they were then screened for years of 2015–2021 (*N* = 3,387), and then articles were excluded that did not focus on adulthood (*N* = 2,401), and were not published in the English language (*N* = 2,396). All articles were then screened for location within the United States (*N* = 659), and duplicates were excluded. Also excluded were literature reviews, meta-analyses, studies not addressing this dissertation's research variables/questions, and not meeting the quality appraisal cut off score of 19 (*N* = 101). Last, articles were screened to only include populations identified as Hispanic, excluding all articles that included other ethnicities or populations within the sample size (*N* = 10).

The second search yielded 462 results (EBSCOhost, Academic Search, PsycInfo). All articles were screened for eligibility using the inclusion and exclusion criteria. Once articles were determined to be peer-reviewed (*N* = 335), they were then screened for inclusion years of 2015–2021 and not published in the English language (*N* = 139), and then articles that did not focus on adulthood were excluded (*N* = 113). All articles were then screened for location within the United States (*N* = 84), and then duplicates were excluded. Also excluded were literature reviews, meta-analyses, medicinal treatments, studies not addressing this dissertation's research variables/questions, and not meeting the quality appraisal cut off score (*N* = 61). Last, after a full text screening to only include populations identified as Hispanic, excluding articles that included other populations within the sample size, a total of 13 articles were selected to be included in the systematic review (*N* = 13). See Figure 1 for Flow Diagram.

Figure 1

PRISMA Flow Diagram



Included Studies Summary Table

The Evidence Table of Included Studies contains helpful characteristics of the 23 included studies. Of the 23 included articles, 10 articles focused on disparities and 13 articles discussed T2DM interventions within the Latinx community, which are the same 13 articles that were reviewed for specific characteristics and specific techniques used within the successful interventions within the Latinx community that have T2DM.

Location of Studies

The locations of studies varied. Most of the studies were conducted in California, specifically San Diego, San Bernardino, San Francisco, Sacramento, and Central and Southern cities ($N = 6$; García et al., 2015; Marquez et al., 2016; Organista et al., 2016; Ramal et al., 2017; Ramírez & Carmona, 2018; Soto et al., 2015). Five studies were located in Texas and Arizona, specifically Central Texas, Harris County, Starr County, Houston, and Little Rock, Arizona ($N = 5$; Brown et al., 2016; Cobb et al., 2017; García et al., 2015; Lin et al., 2019; McEwen et al., 2017). In addition, one study was located in Miami-Dade County, Florida ($N = 1$; González-Guarda et al., 2016) and one study was located in Chicago, Illinois ($N = 1$; Sanchez-Johnsen et al., 2017). Three studies were located in Detroit and Ann Arbor, Michigan ($N = 3$; Darghouth et al., 2015; LeBrón et al., 2017); four studies were located in North Carolina ($N = 4$; Amirehsani et al., 2019; Cubillos et al., 2017; Hu et al., 2016; Mann-Jackson et al., 2018); two studies were located in Connecticut ($N = 2$; Wagner et al., 2018; Wagner et al., 2015); two studies were located in Virginia ($N = 2$; Kaltman et al., 2016; Soto et al., 2015); and one study included six quasi-experimental studies located in Illinois, Arizona, Texas, Colorado, North Carolina, Boston, and Michigan ($N = 1$; Soderlund, 2017).

Summary Table of Included Studies Key Characteristics

The Summary Table of Included Studies Key Characteristics contains the 23 included studies (Appendix G). This table includes basic data for each of the 23 articles that focused on demographic disparities and T2DM interventions within the Latinx community.

Study Characteristics

Location of Included Studies

The locations varied across the 23 included studies. Most studies were conducted in California, specifically San Diego, San Bernardino, San Francisco, Sacramento, and central and southern cities (*N* = 6; García et al., 2015; Marquez et al., 2016; Organista et al., 2016; Ramal et al., 2017; Ramírez & Carmona, 2018; Soto et al., 2015). Five studies were conducted in Texas and Arizona, specifically Central Texas, Harris County, Starr County, Houston, and Little Rock, Arizona (*N* = 5; Brown et al., 2016; Cobb et al., 2017; García et al., 2015; Lin et al., 2019; McEwen et al., 2017). In addition, one study was in Miami-Dade County, Florida (*N* = 1; González-Guarda et al., 2016), along with one study located in Chicago, Illinois (*N* = 1; Sanchez-Johnsen et al., 2017). Three studies were located in Detroit and Ann Arbor, Michigan (*N* = 2 Darghouth et al., 2015; LeBrón et al., 2017), four studies were located in North Carolina (*N* = 4; Amirehsani et al., 2019; Cubillos et al., 2017; Hu et al., 2016; Mann-Jackson et al., 2018), two studies were located in Connecticut (*N* = 2; Wagner et al., 2018; Wagner et al., 2015), two studies were located in Virginia (*N* = 2; Kaltman et al., 2016; Soto et al., 2015), and one study included six quasi-experimental studies located in Illinois, Arizona, Texas, Colorado, North Carolina, Boston, and Michigan (*N* = 1; Soderlund, 2017).

Sample Size of Included Studies

The range of the included studies' sample sizes varied slightly, ranging from 12 participants (Benavides-Vaello & Brown, 2016) to 1,777 participants (Garcia et al., 2015). Legal status of 140 participants' perceptions was assessed (Cobb et al., 2017), in addition to 247 participants identified the contribution of discrimination, violence, and immigration stress contributed to health disparities (Mann-Jackson et al., 2018). The González-Guarda et al. (2016) study included 164 participants and focused on substance abuse and overall contributions of stress among Hispanic men, 203 participants reported underlying obesity to contribute to poor body image and health disparities (Sanchez-Johnsen et al., 2017) and 344 participants identified day laborers and living conditions can contribute to increased psychological distress (Organista et al., 2016). Last, 403 participants also found correlations between discrimination and diabetes (LeBrón et al., 2017), assessing fatalistic beliefs among 24 participants (Ramírez & Carmona, 2018) and if marital status contributes to psychological distress (Darghouth et al., 2015) within the sample size of 868 participants.

Age and Gender of Included Studies

This systematic review focuses on Latinx female and male adults, specifically only looking at studies that identified ages 18 years and older. Thirteen studies focused on females and males in which the authors only listed mean ages, fluctuating from 41.2–70.7 (Amirehsani et al., 2019; Brunk et al., 2017; Cubillos et al., 2017; García et al., 2015; Garcia et al., 2015; Hu et al., 2016; Lin et al., 2019; Marquez et al., 2016; McEwen et al., 2017; Ramal et al., 2017; Soto et al., 2015; Wagner et al., 2018; Wagner et al., 2015). Five studies focused on only men, in which age ranges were listed, varying from 18–81 years old (González-Guarda et al., 2016; LeBrón et al., 2017; Mann-Jackson et al., 2018; Organista et al., 2016; Sanchez-Johnsen et al., 2017). Two

of the included studies that also focused on females and males listed an age range of 18–65 years old (Cobb et al., 2017; Darghouth et al., 2015). Another three studies focused on female participants and only included age ranges from 18–29 years old (Ramírez & Carmona, 2018) and 18 and over (Soderlund, 2017), leaving a remaining study that listed female participants with a mean age of 52.8 (Benavides-Vaello & Brown, 2016).

Population of Disparities and Interventions

Within this systematic review, participants who identified as Latinx living in the United States were considered within the included studies. Latinx includes anyone of Latin descent or origin. The principal researcher extracted data to identify the ethnicity of participants to further provide insight on Latinx disparities, in addition to recognizing which psychosocial and behavioral interventions are most helpful for specific Latinx ethnicities or race.

Within the included disparity articles, seven studies included populations that identified as Mexican (Benavides-Vaello & Brown, 2016; Darghouth et al., 2015; LeBrón et al., 2017; Mann-Jackson et al., 2018; Organista et al., 2016; Ramírez & Carmona, 2018; Sanchez-Johnsen et al., 2017), three different articles reported to mention Hispanic backgrounds (Cobb et al., 2017; González-Guarda et al., 2016; Mann-Jackson et al., 2018), in addition to two articles identifying Puerto Rican (Darghouth et al., 2015; Sanchez-Johnsen et al., 2017) and three studies to include Latino (Darghouth et al., 2015; García et al., 2015; Organista et al., 2016). Cuban was mentioned twice within included studies (Darghouth et al., 2015; González-Guarda et al., 2016), following Chicano to be included within one study (LeBrón et al., 2017). Last, backgrounds of Guatemalan, Salvadorian, and Honduran were identified within one study (Organista et al., 2016).

There were several different ethnicities/races that were identified within the included intervention studies; however, it is also important to note that these identified ethnicities and races were usually mentioned several times within each study. Within the intervention included studies, Hispanic was one of the most identified ethnicities. Specifically, Hispanic was mentioned seven times within the 13 included intervention studies (Amirehsani et al., 2019; Brunk et al., 2017; García et al., 2015; Hu et al., 2016; Soderlund, 2017; Wagner et al., 2018; Wagner et al., 2015). Latino was also mentioned seven times within the 13 included studies (Amirehsani et al., 2019; Marquez et al., 2016; Ramal et al., 2017; Soderlund, 2017; Soto et al., 2015; Wagner et al., 2018; Wagner et al., 2015). Mexican American was identified three times out of the 13 included intervention studies (Garcia et al., 2015; McEwen et al., 2017; Soderlund, 2017) with one study identifying participants who identified as Puerto Rican (Wagner et al., 2015) and another study that participants identified as Mexican (Lin et al., 2019). Last, there was one study that participants reported identifying as Hispanic Americans (Cubillos et al., 2017).

Research Question 1: What are the Health Disparities Within the Latinx Communities?

To examine Research Question 1, "What are the health disparities within the Latinx communities," data were extracted from 10 articles and categorized based on the authors' description. For the purpose of this systematic review, the disparity categories were defined as follows: (a) medical conditions included cancer, cardiovascular issues, prediabetes, diabetes, obesity, and HIV; (b) stress included cultural stress, family stress, family processes stress, marital status stress, adverse experience stress, and sexual identity stress; (c) undocumented included immigration enforcement and legal status; (d) discrimination included victimization and violence; (e) mental health included psychological distress and depression; (f) low SES; (g) social inequalities included social mobility, sociocultural constructs, and syndemic issues; (h)

substance use included alcohol; (i) poor diet included poor nutrition and food insecurity; (j) literacy issues included poor health literacy and low education status; (k) living conditions included neighborhood risk and intra-community tensions; (l) acculturation; (m) poor physical activity; and (n) poor body image.

Medical conditions were the most common disparity within this systematic review. The medical conditions category included the following: cancer, cardiovascular disease, prediabetes, diabetes, and obesity. Within the 10 included studies, diabetes was mentioned four times (Benavides-Vaello & Brown, 2016; LeBrón et al., 2017; García et al., 2015; Sanchez-Johnsen et al., 2017), obesity was discussed within three articles (Benavides-Vaello & Brown, 2016; García et al., 2015; Sanchez-Johnsen et al., 2017), following two studies, highlighting prediabetes (García et al., 2015; Sanchez-Johnsen et al., 2017). Cardiovascular disease was also identified as a disparity having been mentioned in two studies (García et al., 2015; Sanchez-Johnsen et al., 2017), in which cancer was mentioned once (Sanchez-Johnsen et al., 2017). Human immunodeficiency virus, also known as HIV, was identified once (González-Guarda et al., 2016).

Stress was the second most common disparity within this systematic review, being mentioned six times within the included studies. Within this systematic review, stress was categorized with cultural stress (González-Guarda et al., 2016), family stress (González-Guarda et al., 2016), family processes stress (Darghouth et al., 2015), marital status stress (Darghouth et al., 2015), adverse experiences stress (Cobb et al., 2017), and sexual orientation stress (González-Guarda et al., 2016).

Within this systematic review, the undocumented disparity was combined with immigration enforcement and legal status disparities. The principal researcher referenced

authors' definitions when considering categorizations. The term undocumented was mentioned four times out of 10 included studies (Cobb et al., 2017; LeBrón et al., 2017; Mann-Jackson et al., 2018; Organista et al., 2016), along with immigration enforcement being mentioned once (Mann-Jackson et al., 2018) and legal status (Cobb et al., 2017) being mentioned once.

Discrimination, victimization, and violence were categorized together being mentioned five times within the 10 included studies. Specifically, discrimination was reported to be related to legal status (Cobb et al., 2017), overall health impact (Mann-Jackson et al., 2018) and highlighted correlates of interpersonal and ethno-racial discrimination among Latino adults (LeBrón et al., 2017). Both victimization and violence were identified as disparities in one study (Mann-Jackson et al., 2018).

Mental health distress was used as an umbrella term to categorize depression and psychological distress, which was separated from the stress category to highlight impaired mental health and reflect on mental health disorders. Depression was mentioned three times within the included studies (Garcia et al., 2015; González-Guarda et al., 2016; Organista et al., 2016), in which these articles discussed a decrease in mental well-being that was associated with migrant workers and neighborhood socioeconomic positions. Psychological distress was mentioned one time within the included studies (Organista et al., 2016). Specifically, within this study, results indicated being separated, divorced, cohabitating, or single was associated with higher levels of psychological distress compared to being married (Darghouth et al., 2015).

Of the 10 included studies in this systematic review, five studies identified low SES as a health disparity (Organista et al., 2016), and the other four studies linked low SES with reluctance to take time off work to go to doctor appointments and buying healthier foods

(Benavides-Vaello & Brown, 2016; García et al., 2015; LeBrón et al., 2017; Ramírez & Carmona, 2018).

The social inequalities category included social mobility, social constructs, and syndemic considerations, all being mentioned a total of six times within the included studies. Social inequality disparity was reported three times (Cobb et al., 2017; Mann-Jackson et al., 2018; Organista et al., 2016). Social mobility (Cobb et al., 2017), sociocultural constructs (Benavides-Vaello & Brown, 2016), and syndemic (González-Guarda et al., 2016) disparities were only mentioned once within the included studies.

Within the substance use disparity category, the principal researcher decided to also include alcohol use, as both disparities display a pattern of drug use leading to significant impairment in one's life and overall functioning. Substance use was identified once (González-Guarda et al., 2016) within the included studies. Alcohol was also reported once (Garcia et al., 2015) within the included studies.

Poor diet is another identified disparity within this systematic review. Poor diet was mentioned within two of the included studies (Benavides-Vaello & Brown, 2016; Sanchez-Johnsen et al., 2017). Within these two studies, poor diet has been associated with underlying obesity in Latino men, in addition to sociocultural issues in accessing healthy food in low-income households of Mexican American women, resulting in high risk of prediabetes, diabetes, cancer, and cardiovascular disease.

Literacy issues were categorized with poor health literacy and low education, all being mentioned six times within the included studies. Specifically, literacy issues were identified three times (LeBrón et al., 2017; Mann-Jackson et al., 2018; Ramírez & Carmona, 2018). Low

education status was identified two times (García et al., 2015; Ramírez & Carmona, 2018), with poor health literacy only being identified once (LeBrón et al., 2017).

Living conditions is another categorized group that includes neighborhood risk and intra-community tensions. These disparities were mentioned three times within the included studies. Living conditions were mentioned once (Organista et al., 2016). Neighborhood risk was also mentioned only once (Garcia et al., 2015), as was intra community tensions (Mann-Jackson et al., 2018).

Acculturation was mentioned four times within the included studies (García et al., 2015; González-Guarda et al., 2016; Ramírez & Carmona, 2018; Sanchez-Johnsen et al., 2017). Specifically, the studies that discussed acculturation reported this disparity to be associated with significant stress and obesity. Authors also found cultural factors to change within level and years of acculturation.

Poor physical activity was also identified to be a disparity within the Latinx populations. Poor physical activity was reported within two of the included studies (Garcia et al., 2015; Sanchez-Johnsen et al., 2017). Poor physical activity was associated with obesity among Mexican and Puerto Rican men. In addition, poor physical activity was linked to chronic health conditions, weight gain, and mental health issues.

Moreover, poor body image is the remaining disparity that was identified within the included studies. Poor body image was identified within one of the included studies (Sanchez-Johnsen et al., 2017). Poor body image was also associated with Mexican and Puerto Rican men, who have poor diet habits, low physical activity, and are overweight.

In summary, the top four most identified disparities within the 10 included disparity studies were as follows: low SES, diabetes, undocumented, and stress. Specifically, low SES was

identified within 50% of the 10 included articles, as low SES interferes with being able to have financial access to transportation, medical insurance, healthier foods, and medications. Diabetes was another common disparity, being identified within 40% of the 10 included articles; as diabetes is more prevalent than ever within the Latinx community, complications have become more prevalent. Undocumented is another disparity that was identified within 40% of the included articles, specifically discussing a fear of possibly getting deported when going to the doctor, not trusting medical providers, and an inability to access government resources that require citizenship. Stress was another identified disparity, accounting for 40% of the included studies, as stress is often related to additional disparities, such as pressures in sending money back home to extended family, providing financially for immediate family, and experiencing poor work conditions, to name a few.

Research Question 2: What Types of Psychosocial and Behavioral Interventions are Being Conducted for T2DM for the Latinx Population?

To examine Research Question 2, "What types of psychosocial and behavioral interventions are being conducted for T2DM for the Latinx population," the treatment interventions used were extracted from 13 included articles and categorized based on the authors' description. As there were multiple interventions within each included intervention study, the principal researcher decided to incorporate percentages to identify the most documented interventions within the included intervention studies. Thus, the principal researcher determined to list the top three most common interventions and their percentages.

Treatments identified were placed in the following categories: educational programs, evidence-based practices, relaxation and mindfulness techniques, social support techniques, diet and physical activity, social ecological model (SEM), and self and stress management

interventions. For the purpose of this systematic review, the categories were identified as follows: (a) self-management included diabetes management, skills training, in-home based interventions, stress management, lifestyle management and behavioral modifications; (b) educational programs included diabetes education, psychoeducation, healthware web-based education and general educational programs; (c) social and familial approaches, telephone follow up calls, family involvement techniques, social and familial supports and communal coping; (d) health and nutrition included diet modifications, diet recommendations, and physical activity interventions; (e) relaxation included mindfulness techniques and self-care; (f) evidence-based practices included cognitive behavioral therapy and dialectical behavioral therapy; and (g) SEM only included the model itself. Interventions were categorized based on the description/definition of content provided by authors versus the name or category of the group/intervention. For example, Lin et al. (2019) implemented a family healthware, web-based tool that assesses familial risk for diseases that also provides supplementary informative feedback including risk assessment, and behavioral recommendations. The Healthware web-based tool is used to provide educational feedback to participants; thus, it was categorized within the educational program group rather than included within the self-management intervention group. It is important to note that because there were multiple interventions included within each study, it was decided that the categorized groups would have a sum of mentioned interventions, rather than identifying how many articles identified the intervention. In addition, the principal researcher recognized the importance of identifying interventions with multiple interventions; thus, the principal researcher decided to specifically identify the top three most successful interventions that had multiple treatments included within the study. When considering the top three most successful

interventions, the principal researcher reviewed the studies' successful outcomes and outcome data.

Of the 13 included intervention studies, 11 articles were educational programs; however, a few studies included multiple educational programs in single studies. These educational programs included diabetes education (*N* = 7; Brunk et al., 2017; García et al., 2015; Hu et al., 2016; Marquez et al., 2016; McEwen et al., 2017; Ramal et al., 2017; Wagner et al., 2018), psychoeducation (*N* = 1; Wagner et al., 2015), and general educational techniques (*N* = 1; Cubillos et al., 2017). Both diabetes education and psychoeducation were combined in one study (*N* = 1; Amirehsani et al., 2019), and the Healthware web-based tool and educational interventions were applied together in one study (*N* = 1; Lin et al., 2019).

Social support interventions were identified in eight out of the 13 included articles, in which a few studies included multiple social support interventions in a couple of single studies. These social support interventions included family involvement (*N* = 2; Amirehsani et al., 2019; Hu et al., 2016), general social support interventions (*N* = 2; Marquez et al., 2016; Soto et al., 2015), and telephone follow up calls (*N* = 2; García et al., 2015; Wagner et al., 2018). Both family involvement and general social support interventions were combined interventions within one study (*N* = 1; McEwen et al., 2017), and family involvement, social support, and communal support interventions were combined within one study intervention (*N* = 1; Lin et al., 2019).

In the 13 included studies, self-management interventions were identified within 11 studies; however, several combined self-management interventions were identified within single studies. Self-management interventions included the following: self-management skills (*N* = 4; Brunk et al., 2017; García et al., 2015; Soderlund, 2017; Soto et al., 2015), in-home based interventions (*N* = 1; García et al., 2015), stress management (*N* = 1; Wagner et al., 2018),

lifestyle management (*N* = 1; Marquez et al., 2016), and diabetes management (*N* = 2; Hu et al., 2016; Marquez et al., 2016). Self-management skills, in-home based interventions, and behavioral modification interventions were combined and used within one intervention (*N* = 1; McEwen et al., 2017). Self-management and lifestyle management were also used within one intervention (*N* = 1; Ramal et al., 2017). In addition, lifestyle management and diabetes management were combined within another intervention (*N* = 1; Amirehsani et al., 2019). Last, skills training and stress management were combined within one intervention (*N* = 1; Wagner et al., 2015).

Within the 13 included intervention articles, six identified health and nutrition interventions, in which a few studies included multiple nutrition interventions in single studies. Specifically, within the health and nutrition interventions, physical activity was identified (*N* = 3; Brunk et al., 2017; Soderlund, 2017; Soto et al., 2015). One intervention included both diet and dietary recommendations (*N* = 2; Cubillos et al., 2017; Ramal et al., 2017), as well as one study included both diet and physical activity within one intervention (*N* = 1; Lin et al., 2019).

Out of the 13 included studies, relaxation techniques were mentioned within two articles; however, one article included both a relaxation and mindfulness intervention within the primary intervention. These relaxation interventions included general relaxation treatments (*N* = 2; Wagner et al., 2018) and self-care interventions (*N* = 1; Soto et al., 2015). As mentioned prior, both relaxation techniques and mindfulness interventions were included within one study intervention (*N* = 1; Wagner et al., 2015).

Within the 13 included intervention studies, evidence-based practices were identified in one study (*N* = 1; Wagner et al., 2015), having both cognitive behavioral therapy and dialectical

behavioral therapy within one intervention. Both interventions were used with community health workers to better manage stress and diabetes.

Last, the SEM was only identified in one out of the 13 included studies ($N = 1$; Soderlund, 2017). Within this study, the SEM was used as a framework to identify individual factors associated with successful physical activity for Hispanic women. SEM also considered social environmental factors as well.

The top three most identified interventions within the 13 included intervention articles were as follows: diabetes educational interventions, self-management interventions, and social/familial interventions. Specifically, diabetes educational interventions were identified within 70% of the included studies, as diabetes educational interventions have been successfully used to better inform participants, to increase insight about disease, and help improve health habits. Self-management interventions were identified in 70% of the included articles, as self-management interventions have been found to promote healthier habits, to decrease doctor visits and hospitalizations, and to increase autonomy and empower participants to take more control over their treatment process. Social and familial support was identified within 50% of the included articles, as including supportive networks can increase the likelihood of adherence to treatment, especially within collectivistic cultures.

Research Question 3: What are the Characteristics, or Specific Techniques of Helpful T2DM Interventions Within the Latinx Population?

To examine the third research question, "What are the characteristics or specific techniques of helpful T2DM interventions within the Latinx population," the researcher identified characteristic themes. Specifically, within this systematic review, characteristics were defined as a quality or feature of an intervention that was helpful within the 13 included

intervention studies. Characteristics themes were as follows: (a) bilingual components, (b) bicultural staff, (c) culturally sensitive interactive tactics, (d) lifestyle modifications, (e) social and family supports, (f) holistic considerations, (g) manageable and accessible self-management considerations, and (h) culturally modified diet strategies. Specifically, bilingual components included bilingual Spanish speaking staff, bilingual telephone systems for follow up calls, and bilingual manualized intervention curriculum. Bicultural staff included Latinx moderators, having staff members identify as a part of the Latinx community, using cultural values such as respeto and simpatia when interacting with participants, and taking time to develop a cohesive and trusting bond. Culturally sensitive interactive tactics included staff often requesting participants for feedback, encouraging participants to share their stories and insights on how to change behaviors, staff verbally administering scales and questionnaires to counteract possible literacy issues, having one-on-one individualized sessions focused on symptom relief, and having interactive modules that replace words and diagrams with pictures wherever possible to improve engagement and retention of information.

Furthermore, lifestyle modifications included long-term intensive interventions that consider multiple domains within the participant's life, such as accessibility to meal replacements, meal plans, and physical activity recommendations. Social and family supports included family members participating in psychoeducation and diabetes education to improve compliance and accountability, as well as using family heritage within assessment tools to inform the participant and family members of health risks. Holistic considerations included assessments of participants' intrapersonal, interpersonal, institutional, community, and public policy domains, as this has been helpful in considering participants' intersectionality within treatment. Manageable and accessible self-management considerations included in-home

interventions, individualized behavioral modifications, and accessible take home recorded relaxation exercises. Last, a culturally modified diet included changes in social behavior within the family unit, diet recommendations, moderations in different foods, having strategies in replacement sugars, “use of the fork” strategies to aid in portion control, and using collectivistic values within interventions. For example, collectivist cultures may prioritize the needs and goals of family rather than one’s own needs and goals, thus recognizing possible motivators in having participants complete treatment primarily for their families, and children, to improve health and quality of life.

Of the 13 included intervention studies in this review, six reported successes in using bilingual components ($N = 6$; Amirehsani et al., 2019; Cubillos et al., 2017; García et al., 2015; Hu et al., 2016; Wagner et al., 2018; Wagner et al., 2015). Three articles identified successes in using bilingual telephone interventions ($N = 3$; Lin et al., 2019; McEwen et al., 2017; Wagner et al., 2018), along with one article reporting promising outcomes in using bilingual considerations in stress and relaxation management within a group setting ($N = 1$; Wagner et al., 2018). Bilingual diabetes education was found to be helpful within two studies ($N = 2$; Amirehsani et al., 2019; Wagner et al., 2018), as well as manualized bilingual curriculum within one article ($N = 1$; Wagner et al., 2018). Considerations of cultural values were mentioned within one study ($N = 1$; García et al., 2015), specifically, the study reported staff who are knowledgeable of cultural norms and aware of personalismo and *simpatico*, can be helpful in building trust and improving engagement with participants.

Of the 13 included intervention studies in this review, two reported helpfulness in including bicultural staff ($N = 2$; Hu et al., 2016; McEwen et al., 2017). In addition, two articles specifically identified using Latinx moderators, promotoras, also known as a Hispanic/Latinx

community member who receives specialized training to provide basic health education within the community without the formality of a professional health care worker title. In addition, members of the community who have Latinx backgrounds have improved engagement, and have influenced successful outcomes, especially in diabetes self-management (*N* = 2; Amirehsani et al., 2019; McEwen et al., 2017).

Five out of the 13 included intervention studies reported improved outcomes when using culturally interactive interventions. Specifically, requesting frequent feedback, encouraging participants to share their stories, and insight on ways to change behaviors have been helpful to empower and help participants participate in their own treatment, which was found to be successful in one study (*N* = 1; Amirehsani et al., 2019). One study reported verbally administering scales and questionnaires have shown to be successful when considering low literacy (*N* = 1; Hu et al., 2016). In addition, using culturally interactive modules, such as having one on one education to discuss behavioral modifications (*N* = 1; García et al., 2015), focusing on symptom relief (*N* = 1; García et al., 2015), and replacing words and diagrams with pictures to consider low literacy have shown increased engagement and retention of information within one study (*N* = 1; Brunk et al., 2017). In addition, one study found that using a healthware web-based interactive tool that assesses family heritage and provides educational feedback showed improved engagement and increased insight (*N* = 1; Lin et al., 2019).

Out of the 13 included intervention studies, lifestyle modifications were mentioned within three studies. Specifically, authors found that long-term meal replacements, meal plans, physical activity recommendations, and tools to keep track of accountability were successful in one study (*N* = 1; Marquez et al., 2016). In addition, it was noted that implementing participants' perspectives can assist in a better understanding of potential sustainable impacts within

interventions (*N* = 1; Amirehsani et al., 2019). Last, a lifestyle modification program that is called GEM (glycemic load diet, exercise, and self-blood glucose monitoring) found that applying the five levels of assessment (i.e., cognitive, attitudinal, instrumental, behavioral, and societal) was helpful with diabetes outcomes (*N* = 1; Brunk et al., 2017).

Social and family supports were mentioned eight times within the 13 included intervention studies. Specifically, social support and family involvement was found to be helpful in improving compliance, diet, and physical activity (*N* = 8; Amirehsani et al., 2019; Brunk et al., 2017; Hu et al., 2016; Lin et al., 2019; Marquez et al., 2016; McEwen et al., 2017; Soderlund, 2017; Soto et al., 2015).

Holistic considerations were mentioned one time within the 13 included intervention studies (*N* = 1; Soderlund, 2017). Specifically, the study found that implementing the SEM at its five levels—intrapersonal (individual), interpersonal, institutional, community, and public policy—has been found to influence positive change in individual behaviors.

Of the 13 included intervention studies, manageable and accessible self-management considerations were mentioned six times (*N* = 6; Brunk et al., 2017; García et al., 2015; Lin et al., 2019; McEwen et al., 2017; Ramal et al., 2017; Soto et al., 2015). Specifically, some studies found that successful treatment adherence may be linked to include in accessible in-home interventions (*N* = 3; García et al., 2015; Lin et al., 2019; McEwen et al., 2017). In addition, individualized behavioral modifications were identified within two studies and reported how one-on-one communication can aid in encouragement in behavior change (*N* = 2; Lin et al., 2019; McEwen et al., 2017). Last, take-home recorded relaxation exercises were identified to be helpful in one study (*N* = 1; Wagner et al., 2015), as they were shown to improve resource accessibility to participants, improving short-term affect.

Within the 13 included intervention studies, culturally modified diet was reported within three studies (*N* = 3; Brunk et al., 2017; Cubillos et al., 2017; Ramal et al., 2017). Specifically, one article used the Diabetes Self-Management Education Program (DSMEP; *N* = 1; Ramel et al., 2018) and found that self-care behaviors positively influenced fat reduction. In addition, within one study, it was found that Mexican-style diets can be modified to a lower glycemic load diet that is culturally appropriate, as participants can learn to include fiber, fats, vinegar, and cinnamon as "sugar blockers," in addition to continuing to consume small amounts of custom foods that are prevalence to the culture (*N* = 1; Brunk et al., 2017). Within one study, a Mediterranean style diet was used with patient-centered approaches, in results showed behavioral change and increased adherence (*N* = 1; Cubillos et al., 2017).

Chapter 4: Discussion

There are various systematic reviews that discussed Latinx disparities and Latinx interventions for T2DM; however, this systematic review focused on examining and reviewing more recent data, specifically from the period of 2015–2021, with individuals age 18 and older. Additionally, due to the alarming rate of diabetes resulting in poor quality of life and fatalities within the Latinx population, the present study involved examining the disparities this population encounters and identifying the unique characteristics of effective psychosocial and behavioral T2DM interventions to further understand the useful techniques used within the Latinx community. Further discussion about current results, implications, and take-aways follow.

Categorizing

Both disparities and interventions were categorized based on the authors' description and definition of content, versus the name or category of the group defined by the researchers. Based on the search results, the researcher categorized identified disparities into the following categories: medical conditions, stress, undocumented immigration and legal discrimination, mental health, low SES, social inequalities, substance use, poor diet, literacy issues, living conditions, acculturation, poor physical activity, and poor body image.

The categorization of the various interventions also occurred in a natural fashion based on the results of the search. For the most part this was an easy process, as most interventions easily fit into a single category. Interventions were identified into the following categories: self-management, educational programs, social and familial approaches, health and nutrition, relaxation, evidence-based practices, and SEM.

Disparities

As the focus of this study was T2DM interventions, it was important to first identify the overall health disparities that Latinx individuals face. Though the categories of disparities arose naturally, there was also significant overlap. For example, medical conditions, stress, and documentation status were clearly identified categories that were disparities for the Latinx population. However, correlations were also frequently noted about the ways in which these disparities influence each other, further affecting access to treatment for T2DM. For example, having a medical condition increases stress, thus being a combined effect on access to treatment. Another example is deportation, acculturation, legal status, and low SES, which linked back to high rates of stress. This was identified and tracked to the best of the researcher's ability; however, it was sometimes difficult to parse out. Additionally, there was overlap between categories that was not able to be noted or tracked, such as between medical conditions and SES factors. Lower SES is linked to the inability to buy healthier and higher quality foods, which increases the risk for obesity and other medical issues related to T2DM. Additionally, lower SES is related to poorer quality medical insurance, which reduces the quality of medical care and leads to poor medical/health outcomes.

The medical conditions disparity category was the most identified disparity in the included studies. The medical conditions category included cancer, cardiovascular issues, prediabetes, HIV, and diabetes. The prevalence and significance of medical conditions within the Latinx community may be related to why diabetes is one of the main focuses within the literature. Obesity, low physical activity, and poor diet were associated with increased risk of cancer, cardiovascular issues, prediabetes, and diabetes. Additionally, there are cultural values to consider. Hispanic women who have been diagnosed with diabetes have been found to label

foods as “are worth it or not worth it,” it being the health costs/benefits, depending on the context of the social gathering. For example, during holidays, Latinx cultures celebrate with tamales, champurrado, or buñuelos, putting a higher emphasis on the celebratory dishes rather than dietary recommendations. Thus, it is important to consider Latinx customs and their relation to food and social expectations when treating diabetes. Poor physical activity was found to be correlated with low SES, and low neighborhood socioeconomic position, as poverty-stricken areas have been correlated with increased violence, further contributing to Latinx individuals not being able to walk comfortably and safely outside.

SES is a critical factor as it is related to undocumented status, increased medical problems, affordability of health care and a healthy living style (e.g., gym membership and quality ingredients), financial stress that causes family stress, access to transportation to and from medical appointments, and education. SES is linked to the disparity of being undocumented as Latinx often fear being deported and will often avoid asking for fair wages. Social inequalities that are related to legal status have interfered with Latinx accessing resources and deprive the community of basic human rights.

The living conditions category also included neighborhood SES and intracommunity tensions. Specifically, migrant workers reported that as living conditions became more difficult, psychological distress heightened, which increased the lack of communication between family members, further compounding feelings of isolation and despair. In addition, neighborhood SES has been linked to higher rates of diabetes as there have been correlations linking to social inequities, further contributing to the lack of access to healthier food options. Last, intra-community tensions are often correlated with discrimination, violence, and immigration status, exacerbating drug use and depressive symptoms. The research displays how Latinx health

disparities are closely related, often exacerbating one another; thus, it is essential to consider the patient's intersectional identities to further recognize the Latinx health complexities and to be more culturally informed.

As stress was frequently identified within the literature, it is important to evaluate the reasoning behind this commonality. Stress is a common reaction to Latinx life experiences, especially related to Latinx hardships. The extensive amount of stress that the Latinx community experiences extends into all other disparity categories. For example, speaking another language in public is linked to higher levels of discrimination, as well as increased stress about experiencing discrimination. The reason why stress is so important to consider is because of its linkage to many other disparities, including increased blood pressure, feeling of isolation, depression, despair, and not talking to family members or anyone about stress, which further decreases overall quality of life and well-being.

When discussing mental health, specifically depression and psychological distress, migrant workers reported to avoid discussing daily struggles and depression to protect their family from worrying about their well-being, aligning with their collectivistic values, often putting family needs and worries first, rather than their own. Mental health was not discussed in-depth within the included studies, in which only a few articles identified depression and psychological distress. This may be due to stigma related to mental health within the Latinx community. For example, a common value within the Latinx culture is "la ropa sucia se lava en casa," which translates to something like "don't air your dirty laundry in public" shining light on possible shame or embarrassment in discussing hardships and seeking treatment for mental illness in fear of being labeled as "locos" or "crazy."

The literacy category included poor health literacy and low education. Furthermore, low literacy has been correlated with several other health disparities such as racial and ethnic discrimination, violence, and immigration enforcement. Literacy issues are also linked to acculturation levels and low education, as longer time spent within the United States resulted in increased use of the dominant language, English. The common disparities of low literacy and low education within Latinx community can affect Latinx individuals in reading food labels and result in information overload causing confusion. Low literacy often causes Spanish speaking parents to rely on kids to translate; thus, certain activities (e.g., going to the grocery store) are limited to when the kids are available. As low literacy and low education are common disparities in the Latinx community, it is essential that health care providers use patients' native language.

Acculturation was not categorized with additional disparities within this systematic review. Acculturation appears to be a complex, multidimensional disparity that may include Latinx behaviors, attitudes, norms, and values, often affecting each Latinx person uniquely. As Latinx members migrate into a new culture or society, it can cause significant change, as integration of beliefs, values, language, and customs may shift, and depending on the level of acculturation, will continue to shift over time. Latinx acculturation has been linked to various health disparities, specifically low literacy, legal status stress, discrimination, violence, low SES, and psychological distress, as members of the Latinx culture may feel pressure with new societal expectations and possible belief shifts in ethnic identities. The Latinx population may encounter discrimination in not meeting societal expectations, such as speaking the dominant language of English, further contributing to distress. Acculturation was not further discussed within the included articles; however, the responsibility remains to further examine the types and theory of

acculturation to further comprehend these intricate considerations when working with Latinx populations.

Interventions

The next research question and primary focus of this study was to look at the psychosocial and behavioral interventions used in the treatment of T2DM in the Latinx community. Though numerous studies that documented disparities, there were fewer studies documenting interventions. Within most of the included intervention studies, intervention programs used multiple treatments. For example, McEwen et al. (2017) conducted a family-based diabetes intervention on behavioral and biological outcomes for Mexican American adults that implemented self-management, and social and educational supports.

Within the educational programs, it was found that using psychoeducation with culturally tailored modules proved to be effective within Latinx interventions. These effective educational programs prioritized the participant's native language, which improved recruitment, retention, and trust building. Equally important, one-on-one educational diabetes sessions that focused on individualized symptom relief were found to be effective in motivating patients to take the necessary steps to achieve their health goals. As family is prioritized and valued highly within the Latinx population, the findings confirmed the importance of using familial supports within educational treatments. Using familial components within educational interventions has shown increased family member knowledge, information retention, and treatment adherence, as family members are often aiding in supporting new habits, in cooking, exercising, and modifying shared diets.

Familial and social supports, specifically increasing companionship for physical activity, was a successful strategy to promote behavior modifications in increasing physical activity,

aiding in the success of weight loss. As social and familial supportive interventions increase communication within the family about disease risk, they also provide increased knowledge for younger members of participants families, further contributing to instilling helpful health behaviors at a young age and decreasing mortality and risk of diseases. The familial and social supports findings highlighted how family can influence the perception and behavior of its members, which has been shown to benefit participants in increasing motivation and compliance within interventions. Thus, using familial and social supports within interventions should be prioritized when working with Latinx populations.

Self-management interventions that use psychoeducation, promote self-efficacy, implement family involvement, and consider participant disparities have been shown to be effective in improving quality of life. Furthermore, as it is common for the Latinx population to prioritize the physical symptoms of T2DM, interventions that have prioritized somatization have increased participant compliance, insight, and self-management skills. Results indicated that although group self-management interventions were helpful, one-on-one sessions that used specific self-management techniques were most beneficial, as improving self-care behaviors and individualizing self-management skills can reduce hospital admissions and emergency department visits.

When considering the category of health and nutrition, it was found that using focus groups helped increased participant motivation, as participants were more willing to adopt self-care behaviors and held other group members accountable in reaching health goals, further confirming the benefits of implementing companionship within interventions. In addition, when considering dietary recommendations, only using portion control, in comparison to meal replacements, and having slight modifications in ingredients, were shown to increase participant

willingness to make health and nutrition changes. In addition, slight modifications in ingredients, rather than meal replacements, have been found to be more culturally accepted by the Latinx participants within the included studies; as food dishes hold much value within the community, health care providers are urged to avoid meal replacements.

Relaxation and mindfulness may be unfamiliar concepts to the Latinx population, though they have been proven to be effective when paired with stress-management techniques, evidence-based practices, and diabetes education. Furthermore, creating personalized self-care behaviors and engaging in interactive techniques have been shown to be beneficial. As relaxation and mindfulness were not discussed in-depth within the included studies, there is a need for further consideration, as the Latinx population may find additional benefits in learning about relaxation techniques to counteract the significant stress the population faces.

Evidence-based practices, specifically the use of thought restructuring logs, and implementing culturally relevant analogies/stories to introduce learning objectives were found to be helpful. Thus, implementing Latinx cultural values in oral traditions, specifically, storytelling was found to be beneficial in increasing knowledge and insight. As there have been helpful correlations found when using evidence-based practices paired with stress management, psychoeducation, skills training, relaxation techniques, CBT, and DBT, it is important to continue to conduct additional research to assess longer term retention and success. Being aware of the successes within interventions can provide a path for future researchers in assessing additional cultural modifications with future interventions.

Within the SEM model, it was found to be helpful when considering the model's complex interplay between the following factors: (a) intrapersonal (individual), (b) interpersonal, (c) institutional, (d) community, and (e) public policy. There are many benefits in implementing

the SEM model as it allows for a more in-depth understanding of factors that participants may be encountering. Furthermore, the SEM model has also been shown to assist additional perspectives in specific health behaviors, in addition to identifying disparities the population is experiencing; thus, it is essential for health care providers to implement frameworks to explore how Latinx factors interplay with one another. Results indicated helpfulness in using the model within future interventions to improve physical activity for Latinx women with T2DM and identified the usefulness of promotoras to provide informational, emotional, and appraisal supports within interventions, as it further increased treatment engagement and treatment adherence. As the SEM model was only included within one study, further SEM research is needed to improve the understanding of Latinx health and its interactions between the underlying multiple socio-ecological factors.

Multi-Intervention

As discussed, it was typical for intervention programs to use more than one type of treatment. This proved to improve outcomes and increase efficacy of interventions. For example, diabetes education has been linked to be most successful when paired with social and familial involvement and diabetes self-management. Diabetes psychoeducation coupled with relaxation techniques has been found to be effective in improving diagnosis knowledge, therapeutic alliance, and positive affect. Within the included intervention studies, it was found that social and familial supports coupled with behavioral modifications correlated with increased adherence to treatment, which contributed to increased physical activity and weight loss. These benefits were increased with recruitment of a designated family member to be the health educator with a goal of eliciting conversation about risk. Also, recruiting a family health educator encouraged risk reducing behaviors within the entire family, activating support and encouragement within

the family system. Last, self-management techniques that have used components of psychoeducation, diabetes education, and familial supports were shown to be successful within the included intervention studies.

Characteristics

This part of the study was intended to gather and summarize what the current literature has identified as the effective characteristics and qualities of psychosocial and behavioral intervention addressing T2DM in Latinx communities. The common characteristics found within the included intervention articles can aid in further understanding Latinx cultural values in the hopes of improving high quality care within the Latinx population. When reviewing the common characteristics and helpful techniques within the included intervention studies, the principal researcher decided to identify five common themes: Latinx staff, Spanish speaking, quality of relationships, cultural values considered, and cultural modifications in treatment. The helpful characteristics and techniques are discussed below.

Within the included studies, research teams with staff who identified as a member of the Latinx community had increased trust, engagement, and treatment adherence among participants. Moreover, Latinx research staff who represent the local community have been helpful in the assessing for cultural considerations within interventions, often also providing insight on how cultural norms may influence diabetes self-management. In addition, staff who represent the local community have also provided context in understanding Latinx disparities and barriers within the Latinx community, often prompting discussions about modifying treatments to best serve the unique Latinx population. As most of the included intervention studies considered including a Latinx member of the community within the research term, a few other studies used a single Latinx moderator. A Latinx moderator is a person who ensures the smooth running of

discussions and can manage the group processes and dynamics in discussing relevant information, ideas, and response of the group.

As low literacy and health literacy continue to be a disparity within the Latinx community, it continues to be essential to provide Latinx participants with treatments in their native language. Spanish speaking components were often used within the included studies, increasing accessibility, trust building, participant engagement, and retention of information. It was often found that the use of simple language can demonstrate the easy-to-use tools like pedometers and food logs, contributing to successful outcomes and self-management skills. Within the included studies, it was reported that using simple, clear, and familiar terminology was most helpful as it decreased the possibilities of confusion, information overload, and difficulties in comprehension, further improving knowledge and retention of information. In addition, within the included studies, it was found that replacing words and diagrams with pictures was beneficial as Latinx participants reported increased engagement and information retention. Last, interventions also included cultural sensitivity components for low literacy participants; thus, some interventions included a bilingual moderator to verbally administer measures to compensate for possible literacy issues in which participants reported being receptive to the facilitated psychoeducation and reported increased comprehension of measures and psychoeducation.

Quality of relationships was another common important theme throughout the included studies. Specifically, it was found that when the research team would take additional time to speak with participants, consider cultural values, implement casual talk, and encourage feedback and storytelling, there was increased trust, engagement, and adherence to treatment. In addition, quality of relationships among participants has been shown to increased treatment adherence,

specifically, physical activity. As participants reported close relationships with other group members, participants reported increased motivation in adopting self-care behaviors.

Within the included studies, cultural values were often considered. Moreover, there were some mentions of personalismo, simpactico, respect, fatalismo, and familismo within the included studies. For example, fatalism was briefly discussed, which is a common Latinx value in which members of the community relate events or actions to fate or destiny. However, results revealed a lack of evidence for fatalistic beliefs being correlated with Latinx health disparities, as participants reported not believing in the fatalistic views, but rather engaged in preventative behaviors and reported strong understandings of the roles of individually controlled dietary behaviors in disease risk. In addition, collectivistic values were considered within interventions. For example, one study used the collectivistic value within a diabetes intervention, in which participants who had diabetes were encouraged to implement behavioral modifications to reduce diabetes symptomology and improve quality of life by modeling good diet behaviors for their children, in which participants reported increased motivation and treatment adherence, also instilling protective factors. Moreover, this study recognized the importance of familial beliefs and applied them within treatment to increase adherence. In addition, tailored self-care and familial/social supports were considered throughout the included studies, further increasing treatment adherence, positive affect, and information retention. Also, many included studies implemented familial and social supports within interventions. For example, interventions that examine physical activity, diet modifications, and weight loss, found that family and friends that assist in grocery shopping, who also worked out together, and had shared diets, had a decrease in body fat, and increase in motivation, and treatment adherence.

Modifications in treatment was another common theme and characteristic found within the included studies. Specifically, interventions that identified participants' disparities displayed increased adherence and retention of information. In addition, modifying interventions to be in-home increased accessibility and convenience for participants, also showing increased treatment adherence and self-efficacy in self-management skills. Moreover, take-home, pre-recorded psychoeducation and relaxation videos were reported to be useful, further contributing to long-term information retention and treatment adherence. Last, interventions that used one-one-one in-person, face-to-face, psychoeducation, that also focused on symptom relief and implementation of group sessions, also found that participants reported increased information retention, improved disease knowledge, and improved self-management skills.

As displayed within the included studies, there is an abundance of helpful data identifying Latinx disparities; however, it is important to also note that there continues to be minimal treatments beyond medicinal interventions for the Latinx community. When answering Research Question 3, results revealed the important characteristics to consider when working with the Latinx community; however, these findings were minimally seen within the included intervention studies. This may be due to the lack consideration of these essential characteristics within the current research.

In summary, the majority of the studies within this review provided helpful information related to Latinx disparities, the psychosocial and behavioral interventions for T2DM and helpful characteristics to consider when working with the Latinx populations. The researcher aimed to not only provide additional insight on these aspects, but to also relay the information in a helpful and culturally appropriate manner.

Useful Recommendations for Health Care Providers

This systematic review was intended to be a helpful resource for health care providers working with the general Latinx population in addition to Latinx who have been diagnosed with T2DM. Thus, the following recommendations may be used to encourage health care providers to use the strategies and specific interventions that have been shown to be useful when working with the Latinx population.

Further understanding Latinx cultural customs proves to be critical in further understanding the complexities of barriers and disparities within the Latinx community. Additionally, further exploring the Latinx values of familismo, respeto, personalismo, simpatia, and fatalismo will aid in better understanding how these cultural values influence relationships and possible treatment adherence. Also, as storytelling has been identified to be a core component of the Latinx culture, it is essential for health care providers to further educate themselves on the importance of this custom to further build cultural humility and to implement aspects of storytelling appropriately within future research studies.

As results have also shown promise in treatment adherence and participant engagement, health care providers should continue to use bicultural research staff, Latinx moderators, promotoras, or Latinx members who identify closely with the local community. As self-care may be a new concept for members of the Latinx community, it may be beneficial for patients to be able to learn and identify personalized self-care to better manage diabetes symptomology in addition to better managing health disparities. For example, additional studies that assess Latinx participants' daily routine, interests, and hobbies may be able to implement more helpful self-care techniques in reducing symptomology and disparities.

In addition, it may be helpful for health care providers to consider culturally sensitive diet modifications, as food is a centerpiece custom within the Latinx culture. For example, Latinx dietitians and nutritionists who specialize in Latinx foods can play an active role in the consideration of Latinx food modifications. Moreover, using diet modifications in ingredients rather than using meal replacements can be more culturally appropriate and may increase treatment adherence.

When discussing participants' native language, it is important to consider different Spanish dialects when working within the Latinx population as terms and overall pronunciations may be significant different among dialects. In addition, as low literacy has been linked to low education and low health literacy, it is important to consider using non-clinical medical terminology when administering psychoeducation to lower the chances of information overload and confusion. Using simple, casual, and clear terminology can prevent any difficulties in comprehension.

Last, health care providers should consider patients' intersectionalities as it has been found to be helpful to better understand patients' multiple identities. Health care providers who recognize race, class, gender, and additional demographics can be beneficial in better understanding the Latinx community. Further identifying and understanding these social categorizations of intersectionality, health care providers can better acknowledge the differences among the unique Latinx population.

Limitations and Potential Contributions

As this review was focused on the published, peer-reviewed, literature restricted to the English language and the years of 2015–2021, there was the possibility of publication bias. The

exclusion of foreign language articles or grey literature resources may have eliminated data that could have added context to this systematic review.

There were also several limitations in the current study. First, there were a limited number of included studies within this systematic review because of the inclusion and exclusion criteria and quality appraisal cut off score. As the principal researcher recognized the vast research on T2DM and Latinx health disparities, the principal researcher decided to narrow the search in including only Latinx participants, eliminating large amounts of research articles that may have contributed helpful information in answering the research questions.

In addition, there were small samples of recruited participants within the included studies. Specifically, the smallest sample size cohort was nine participants, and the largest sample size cohort was 1,777 participants. This can make it difficult to determine the generalizability of the findings among the Latinx adult population.

Furthermore, as the principal researcher implemented a quality appraisal cut off score that ensured the exclusion of any potential weak research articles, the cut off score eliminated several studies that could have contributed to answering the research questions. This quality appraisal process was also completed following the data extraction process to minimize bias in the overall selection of articles.

The final limitation of the included articles related to the measures used within the studies. An overwhelming majority of the articles relied on self-reported measures, which could have led to biases affecting the reliability of collected data. For example, patients may have over or under reported symptoms or responses to minimize or exacerbate their problems. Furthermore, participants may not have been able to accurately assess themselves or have changed perspectives on their own behaviors, beliefs, attitudes, and intentions.

Despite these limitations, the principal researcher took appropriate steps to increase the quality and strength of the systematic review. To minimize bias in the implementation of the methodology, the principal researcher recruited two master's-level psychology students as research assistants to participate in the screening, data extraction, and quality appraisal processes. In addition, the principal researcher established inter-rater reliability between the research assistants to enhance the consistency of the various rating procedures.

Recommendations for Future Research

Research studies are needed to assess the sustainability of action plans. Moreover, action plans need to be further assessed to understand their impact on glycemic control for diabetes risk factors. In addition, studies are needed to further address emotional eating and mental health factors within the Latinx community. Mental health continues to be stigmatized within our society, and within the Latinx community, making it important for future researchers to continue to assess these stigmatizations to aid in the dismantling of misinformation.

Additionally, it would be beneficial for future researchers to conduct more extended longitudinal studies with multiple follow-up assessments to track retention of information and use of self-management skills, in addition to tracking symptomology. Furthermore, moving beyond symptom-level data and the ability to function, other factors that influence an individual's quality of life as well as the impact on children and the next generation need to be more comprehensively investigated. Furthermore, future researchers can consider including psychoeducation in discussing the impact of children and the next generation to participants who are parents to increase motivation and treatment compliance as there is a strong value in Latinx parents of putting their children before themselves.

Further assessing Latinx intersectionalities will enable health care providers to focus on solutions that are informed by Latinx experiences. For example, identifying people's intersectionalities can provide a framework for recognizing and addressing the needs of individuals who are most disadvantaged, encouraging the acknowledgement of differences among populations, and signaling for increased needs. Moreover, assessing Latinx participants' intersectionalities while using storytelling may empower Latinx individuals to understand they are playing an active role in their treatment and increase autonomy.

As there has been vast research completed to identify Latinx disparities, additional research needs to be completed to identify the protective factors. In addition, further examining possible Latinx protective factors may encourage healthy family outcomes, mitigating negative outcomes. Future research can begin to examine possible protective factors by further assessing Latinx customs and values. For example, familismo is a common value within the Latinx culture, where family is often prioritized, and is often linked to dedication, commitment, and loyalty to the family. Thus, familismo can be used in motivating participants to adhere to treatment for their families, modeling healthier behaviors for future generations. Familismo can possibly be a Latinx protective factor, though it is also important to explore whether there are risk factors in familial supports as well.

As the majority of Latin Americans are Christian, it is important to consider possible faith-based interventions for future research. As faith-based interventions were not discussed within the included studies, it is recommended that researchers continue in creating a research team that includes Latinx members of the local community to establish cohesive relationships and trust. In addition, assigning pastors and church members to work alongside participants

through religious practices in improving quality of life can be empowering and beneficial for the Latinx population.

The quality of relationships is an important value within the Latinx population; thus, examining the role of the relationship between the research team and participants is crucial. Future research may benefit from research teams providing appropriate disclosures when building relationships with participants. Disclosure can play a key role in forming strong relationships and help participants feel understood and accepted. In addition, appropriate disclosures can normalize participants' experiences, increasing feelings of validation, building rapport, and instilling hope. Of course, within future research, researchers should consider and identify appropriate disclosures, and always prioritize boundaries and participants' goals.

Dancing is another important component within the Latinx culture, as it is tightly woven into the traditions and the movements of Latin ancestors. Thus, future research should consider using this value in physical activity interventions. Specifically, exploring various dance styles coming from different countries, such as salsa, bachata, rumba, bomba, plena reggeaton, merengue, and mambo to name a few. Future research can explore Latin dance, possibly paring it with psychoeducation and diabetes education.

Last, when considering Latinx cultural interests, rituals, and factors, it may be beneficial to implement interactive videos within future interventions. For example, the Latinx population enjoys watching telenovelas, a Latin America television soap opera. Telenovelas play an important role in communicating Latin American issues, usually capturing the audience's attention by thrilling storylines. The Latinx community watches telenovelas routinely, which can be a vital component in possibly displaying psychoeducation through video storytelling.

Telenovelas are accessible and powerful within the Latinx population, which can be beneficial if used within future research.

Conclusions

The present systematic review highlights important areas that address gaps within the research to increase awareness of Latinx health disparities and the psychosocial and behavioral interventions for T2DM. This systematic review was intended to summarize Latinx disparities, psychosocial and behavioral interventions, and helpful characteristics of successful interventions when working with Latinx communities. The literature demonstrates how disparities have vastly impacted the quality of life and well-being of the Latinx community who are often disarrayed in societal expectations, constructs, and norms. The research demonstrates the importance of considering various disparities and cultural considerations that are unique to this population and emphasizes the importance of using culturally modified interventions when treating Latinx populations that have been diagnosed with T2DM.

As T2DM continues to negatively affect the Latinx communities, recent data continue to show alarming rates in diagnoses. Disparities tend to fall into the following categories: medical conditions, stress, undocumented, discrimination, mental health, low SES, social inequalities, substance use, poor diet, literacy issues, living conditions, acculturation, poor physical activity, and poor body image. Interventions tend to fall into the following categories: self-management, educational programs, social and familial supports approaches, health and nutrition, relaxation, evidence-based practices, and SEM. The included 23 studies were mostly based on each patient's self-reported symptoms and focused on the reduction of symptomatology to improve mental health, physical health, and overall quality of life. It is also important to consider there may be secondary implications within the areas stated above, as improved physical activity can also

improve mental health and symptomatology. It is the hope that this systematic review provides readers with valuable information that highlights the multifaceted complexities of Latinx disparities and the current psychosocial and behavioral interventions for T2DM. It is this researcher's hope that the results of this can be used to inform future development in research and practice to continue the search for better informed, culturally sensitive interventions for T2DM.

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TABLES

Table 1

Disparities

	Abbreviated Reference author and Year	Abbreviated Citation	Title of Article	Location	Disparities	Population	Sample Size	Age Range, mean	Gender	Key Conclusions:
1	Cobb, Xie, Meca, Schwartz, Moise, 2017	Cobb et al., 2017	Perceptions of Legal Status: Associations with Psychosocial Experiences among Undocumented Latinos/as	Houston, TX Little Rock, AR	• Undocumented • Social Inequality • Adverse Experiences • Discrimination • Legal Status • Social Mobility	Hispanic	n = 140	Age Range 18-60	• Female • Male	• Undocumented participants reported less social equality as evidenced by lower well-being, increased experiences of discrimination, and a more adverse context of reception. • Undocumented participants reported issues in limited opportunity/restricted social mobility and discrimination/unfair treatment.
2	Mann-Jackson, L., Song, E.Y., Tanner, A.E., Alonzo, J., Linton, J.M., & Rhodes, S.D. 2018.	Mann-Jackson et al., 2018	The Health Impact of Experiences of Discrimination, Violence, and Immigration Enforcement Among Latino Men in a New Settlement State	North Carolina	• Discrimination • Violence • Undocumented • Intra-community Tensions • Victimization • Social Inequality • Literacy • Immigration Enforcement	• Mexican • Hispanic	n = 247	Age Range 18-64	Male	• Founded that racial/ethnic discrimination, violence, and immigration enforcement contribute to health disparities. Participants reported high rates of unfair treatment, discrimination, or violence, and questioning about their immigration status. • Having been questioned about one's immigration status was significantly associated with increased drug use and increased depressive symptoms.
3	Gonzalez-Guarda, McCabe, Santis, and Provencio-Vasquez, 2016	Gonzalez-Guarda et al., 2016	The Contribution of Stress, Cultural Factors, and Sexual Identity on the Substance Abuse, Violence, HIV, and Depression Syndemic Among Hispanic Men	Miami-Dade County, FL	• Syndemic • Violence • Substance Use • Depression • HIV • Acculturation • Sexual Orientation Stress • Family Stress • Cultural Stress	• Hispanic • Cuban	n = 164	Age Range 18-55	Male	• Correlation found between substance abuse, violence, HIV risk and depressive symptoms among Hispanic men, indicating a higher-level phenomenon a syndemic factor. • Results from Structural Equation Modeling (SEM) supported the syndemic factor among Hispanic men. • While family/cultural stress and homosexual identity were risk factors for the syndemic factor, family support was protective.
4	Sanchez□Johnsen, Craven, Nava, Alonso1, Dykema□Englade, Rademaker and Xie. 2017	Sanchez□Johnsen et al.,2017	Cultural Variables Underlying Obesity in Latino Men: Design, Rationale and Participant Characteristics from the Latino Men's Health Initiative	Chicago, IL	• Obesity • Prediabetes • Diabetes • Low Physical Activity • Poor Diet • Poor Body Image • Cardiovascular Disease • Cancer • Stress • Acculturation	• Mexican • Puerto Rican	n = 203	• Mexican, mean age 34.45 • Puerto Rican, mean age 28.25	Male	• There were no significant differences in religion, education, health insurance, body mass index, body fat, hip, and waist measurements, and the language preference of the interview. • Results implicated the development of a future intervention that incorporates the role of cultural factors into a community participatory obesity intervention for Latino men.
5	Organista, Ngo, Neilands, and Kral, 2017	Organista et al., 2017	Living Conditions and Psychological Distress in Latino Migrant Day Laborers: The Role of Cultural and Community Protective Factors	San Francisco, CA	• Undocumented • Day Laborers • Low Socio-Economic Status • Psychological Distress • Depression • Social Inequality • Living Conditions	• Mexican • Guatemalan • Salvadoran • Honduran • Latino	n = 344	Age Range 18-81	Male	• Results show as living conditions become more difficult, psychological distress increases for Latinos migrant day laborers (LMDLs). • LDLs would avoid discussing details of their daily struggles with family as they wanted to protect them from worrying about their health or general well-being. • This would lead to lack of communication with family members, increasing feelings of isolation and compound their feelings of 'desesperacion' or despair.
6	LeBrón, Spencer, Kieffer, Sinco, Piatt & Palmisano, 2017	LeBrón et al., 2017	Correlates of Interpersonal Ethnoracial Discrimination Among Latino Adults with Diabetes: Findings from the REACH Detroit Study	Detroit, MI	• Discrimination • Undocumented • Diabetes • Low Socio-economic Status • Health Literacy	• Mexican • Chicano	n = 403	Age Range 48.85	Male	• Correlates between interpersonal ethnoracial discrimination in a sample of adult Latinos with diabetes vary according to social characteristics linked with immigration-related factors and language use. • Immigrants who lived in the United States for 10 to 19 years at the time of the survey generally reported less frequent discrimination than their US-born counterparts and immigrants who had lived in the United States for less than 10 years or at least 20 years. • The results of this study also indicated that Latinos who were more [illegible]
7	Garcia, Lee, Hazzouri, Epstein, Haan 2015	Garcia et al.,2015	The Impact of Neighborhood Socioeconomic Position on Prevalence of Diabetes and Prediabetes in Older Latinos: The Sacramento Area Latino Study on Aging	Sacramento, CA	• Diabetes • Prediabetes • Low Socio-Economic Status • Neighborhood Risk • Obesity • Depression • Cardiovascular Disease • Low Educational Status • Alcohol use • Physical Activity • Marital Status • Acculturation	Latino	n = 1777	Age Mean 70.7	• Female • Male	• Within the study, higher NSEP was associated with lower diabetes prevalence. • Neighborhoods with higher SEP had a lower prevalence of diabetes. • This study highlights the importance of considering neighborhood factors that may place older Latinos at high risk for this disease. • Thus, innovative outreach programs that reduce diabetes in older Latino communities are needed.
8	Benavides-Vaello, Brown 2016	Benavides-Vaello & Brown, 2016	Sociocultural Construction of food ways in low income Mexican American women with Diabetes: A qualitative study.	Starr County, TX	• Diabetes • Sociocultural Constructs • Low Socio-Economic Status • Obesity • Poor Diet	Mexican	n = 12	Age Mean 52.8	Female	• Hispanic women used unique strategies to adjust their diet, particularly portion control; for example, they emphasized the 'use of the fork', based on the notion that Hispanic finger foods are less healthy. • Women categorized foods as bad or acceptable, depending on the context, such as important family or social gatherings. • Those with years of diabetes experience confidently took charge of the disease based on knowledge of their bodies and a desire to avoid complications, while acknowledging brief infractions of dietary 'rules' and balancing various social roles and expectations
9	Ramirez, Carmona, 2018	Ramirez & Carmona, 2018	Beyond Fatalism: Information Overload as a Mechanism to Understand Health Disparities.	Central CA cities	• Acculturation • Poor Nutrition • Literacy • Low Educational Status • Food Insecurity	Mexican	n = 24	Age Range 18-29	Female	• Results showed a lack of evidence for fatalistic beliefs and barriers in information overload. • While previous studies have documented negative associations between holding fatalistic beliefs and engaging in preventive behaviors, and particularly among ethnic minority populations, this study found minimal evidence for fatalistic beliefs among young adult Mexican American women. • Instead, participants reported strong understandings of the roles of individually controlled dietary behaviors in disease risk, but reported that too much information about nutrition is confusing and unhelpful for making dietary choices.
10	Darghouth, Brody, and Alegria, 2015	Darghouth et al.,2015	Does Marriage Matter? Marital Status, Family Processes, and Psychological Distress Among Latino Men and Women	Ann Arbor, MI	• Psychological Distress • Marital Status Stress • Family Processes Stress	• Mexican • Cuban • Puerto Rican • Latino	n = 868	Age Range 18-65	• Female • Male	• Results indicated being separated, divorced, cohabitating, or single was associated with higher levels of psychological distress compared with being married. • For women, being separated or divorced was associated with higher levels of psychological distress compared with being married, but for men, distress was not related to marital status. • For both men and women, lower levels of support and higher levels of cultural conflict and burden in the family were related to higher psychological distress.

Table 2

T2DM Psychosocial and Behavioral Interventions

Article #	Author/Year	Abbreviated Citation	Title	Intervention(s)	# of sessions	Characteristics	Design	Ethnicity/Race	Sample Size	Age: Adult	Gender	Location	Settings	Brief summary of results:	Successes of treatment
1	Jie Hu, PhD, RN, FAAN, Karen A. Amirehsani, PhD, FNP-BC, Debra C. Wallace, PhD, RN, FAAN, Thomas P. McCoy, PhD,	Hu et al., 2016	A Family-Based, Culturally Tailored Diabetes Intervention for Hispanics and Their Family Members	Diabetes Education Family Involvement Diabetes Management	8 weekly sessions 2 session follow up	• Family Involvement Spanish	• Empirical • Follow-up • Interview • Quantitative	Hispanic	• n = 186 (total) • n = 92 (T2DM) • n = 94 (family members)	Mean Age 49	• Female • Male	Central Regions, NC	• Clinical site • Community Church	• Intervention patients improved in diabetes knowledge and diabetes self-efficacy over time but did not sustain at 6-month follow-up • A1C was lower at 1-month follow-up • Family members had improvements in diabetes knowledge and physical health–related quality of life	• Yes • Including family members, psychoeducation in culturally tailored modules • Self-management techniques
2	Becky Marquez1, Andrea Anderson, Rena R. Wing, Delia S. West, Robert L. Newton, Maria Meacham, Helen P. Hazuda, Anne Peters, Maria G. Montez, Stephanie T.	Marquez et al., 2016	The Relationship of Social Support with Treatment Adherence and Weight Loss in Latinos with Type 2 Diabetes	Diabetes Lifestyle Intervention Social Supports Diabetes Education Diabetes Management	6 phone calls Follow up calls at 1 year mark	Intensive Lifestyle Intervention (ILI) is an extensive and intensive program	• Empirical • Quantitative	Latino	n = 278	Mean Age 57	• Female • Male	San Diego, CA	Clinical sites	Findings suggest males and females differ in the type of social support received and the effects it has on treatment adherence. The relationship between social support and weight loss did not depend on sex. For both sexes, having family and friends join in physical activity predicted weight loss by promoting adherence to physical activity	•Yes •Social support •No more than 6+ calls •A multicultural team/ treatment
3	Julie Wagnera, Stephen Armelih, Howard Tennenc, Angela Bermudez-Millac, Rafael Pérez-Escamilla d. 2018	Wagnera et al., 2018	Effects of stress management and relaxation training on the relationship between diabetes symptoms and affect among Latinos	Diabetes Education Stress Management Relaxation Telephone follow up calls Diabetes Management	8 SMR bilingual sessions Telephone system calls	•Bilingual telephone system •Studies affect	• Empirical • Quantitative	•Latino •Hispanic	•n= 55 •DE-only; n = 23 •DE + SMR; n = 32	Mean Age 57	• Female • Male	CT	Hartford Hospital	Following treatment, participants in the DE + SMR, compared to DE-only condition, showed weaker positive associations between levels of diabetes symptoms and nervous affect. This occurred in the absence of overall mean differences in daily affect across the treatment groups.	•Yes •SMR sessions improved affect of those coping with T2DM within Latino population

Article #	Author/Year	Abbreviated Citation	Title	Intervention(s)	# of sessions	Characteristics	Design	Ethnicity/Race	Sample Size	Age: Adult	Gender	Location	Settings	Brief summary of results:	Successes of treatment
4	Karen A. Amirehsani, PhD, FNP-BC, Jie Hu, PhD, RN, FAAN, Debra C. Wallace, PhD, RN, FAAN, Zulema A. Silva	Amirehsani et al.,2019	Hispanic Families' Action Plans for a Healthier Lifestyle for Diabetes Management	Diabetes Education Psychoeducation Family Involvement Diabetes Management Diabetes Lifestyle Intervention	5 focus groups 8 week Diabetes Education	•Bilingual/ bicultural •Focus groups •Familismo	• Empirical • Interview • Focus Group • Qualitative	•Latino •Hispanic	• n= 84 total • n=49.5%, t2dm dx participants • n=50.5% family participants	Mean Age 44.2	• Female • Male	Greensboro, NC	• Community clinics • Hispanic churches	The findings provide action plans that the alongside family members made after participating in an 8-week diabetes educational program.	• Yes • Culturally tailored action plans created within the family to support and prevent t2dm • Considers food regulation in relation to emotional control
5	Wagner, Julie,Bermudez-Millan, Angela,Damio, Grace,Segura-Perez, Sofia,Chhabra, Jyoti, Vergara, Cunegundo,Perez-Escamilla, Rafael.2015	Wagner et al., 2015	Community health workers assisting Latinos manage stress and diabetes (CALMS-D): rationale, intervention design, implementation, and process outcomes	Stress Management Psychoeducation Skills Training Relaxation Mindfuless Cognitive Behavioral Therapy Dialectical Bx Therapy	8, 2 hour sessions	• Culturally sensitive • Randomized trial	• Empirical • Quantitative	• Latino • Hispanic • Puerto Rican	n= 107	• Mean Age 60.32	• Female • Male	Hartford, CT	Community Center	• Participants reported high credibility and expectancy for treatment effects • They were well socialized to the study and its goals prior to attending any intervention sessions • Participants who attended reported high therapeutic alliance and high satisfaction with the intervention • The CHW delivered the intervention with a high degree of fidelity.	• Yes • Psychoeducation and culturally tailored intervention strategies proved effective in dx knowledge, therapeutic alliance, and positive affect
6	Patricia Davern Soderlund, PMHNP, PhD 2017	Soderlund, 2017	The Social Ecological Model and Physical Activity Interventions for Hispanic Women With	Social Ecological Model Physical Activity Self Mangagement	Group sessions Duration of 1 month	• Latinx • Women • Physical Activity	• Quantitative	• Latino • Hispanic • Mexican-American	N/A	18 and older	Female	Yes- • Illinois • Arizona • Texas • Colorado • North Carolina	• Clinics • Churches • YMCA • Community settings	Socio Ecological Model was found to be a part of several various interventions towards increasing self care in Hispanic women coping with T2DM	Yes – • Highlights the important of the social ecological model in its various uses included in interventions such as PA

Article #	Author/Year	Abbreviated Citation	Title	Intervention(s)	# of sessions	Characteristics	Design	Ethnicity/Race	Sample Size	Age: Adult	Gender	Location	Settings	Brief summary of results:	Successes of treatment
7	Edelweiss Ramal, PhD, RN , Andrea Champlin, MPH , and Khalod Bahjri, MD, DrPH, MPH, 2018	Ramal et al., 2018	Impact of a Plant-Based Diet and Support on Mitigating Type 2 Diabetes Mellitus in Latinos Living in Medically Underserved	Plant Based Diet Diabetes Education Self Management Dietary Recommendations Lifestyle Intervention	5 Week Educational Program 17 Group Participants	• plant based meals • self-management • promote and maintain lifestyle changes	• Empirical • Interview • Focus Group • Qualitative • Quantitative	• Latinos	n = 42	• Mean Age 53	• Female • Male	San Bernadino, CA	Three community clinics in MUAs located	Participating in the DSMEP conducted before the randomization of the participants seemed to have motivated both groups to adopt and continue self-care behaviors that positively impacted 3 of the variables measured in this study as significant reduction in fat intake, A1C levels, and hip circumference for both	Yes - The statistically significant effect of support on A1C levels suggests that other factors besides the DSMEP were instrumental in this decrease, such as the focus group support offered to the experimental group
8	McEwen, M., Pasvogel, A., Murdaugh, C., and Hepworth, J. (2017)	McEwen et al., 2017	Effects of a Family-based Diabetes Intervention on Behavioral and Biological Outcomes for Mexican American Adults	Family Involvement Diabetes Education Self Management Social Supports In Home Interventions Behavioral Modifications	6 month Duration Pre-Post Measures	• Dyads • Culturally Tailored • Family Based	• Empirical • Quantitative	Mexican Americans	n = 157	• Mean Age 53.3	• Female • Male	AZ	Hispanic urban neighborhoods	Study findings indicated that the diabetes self-management support intervention increased diabetes self-management for healthy eating and physical activity and decreased physician distress, regimen distress, interpersonal distress, and total diabetes distress	Results are consistent with prior research that has documented that DSME/Ss are effective in improving self-care activities to manage one's diabetes regimen.
9	Garcı´a, A.A., Brown, S.A., Horner, S.D., Zun˜iga, J., and Arheart, K.L. (2015)	Garcı´a et al., 2015	Home-based diabetes symptom self-management education for Mexican Americans with type 2 diabetes	Diabetes Education Bx Modification Self Management In Home Interventions Telephone follow up calls	8 Weekly in home 8 Bi-Weekly Follow up calls	RN assessed symptoms In Home interventions	• Empirical • Quantitative	• Hispanics • Mexican American	n = 72	• Mean Age 49.6	• Female • Male	Central TX	• Urban and Rural Community Centers • In-Home visits	Intervention participants showed statistically and clinically significant improvements in HbA1c at 2 months although those improvements were not sustained at 6 months. Improved number of symptoms, severity, DBP, total and LDL cholesterol levels, diabetes knowledge, self-efficacy, empowerment and quality of life.	Yes- This intervention supports the importance of focusing on patients' diabetes symptoms. Approaching DSME from the perspective of patients' recent symptoms helps patients understand the immediate effects of their behaviors on symptoms and diabetes status

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1	**Article #**	**Author/Year**	**Abbreviated Citation**	**Title**	**Intervention(s)**	**# of sessions**	**Characteristics**	**Design**	**Ethnicity/Race**	**Sample Size**	**Age: Adult**	**Gender**	**Location**	**Settings**	**Brief summary of results:**	**Successes of treatment**
11	**10**	Lin, J., Myers, M. F., Wilkinson, A. V., & Koehly, L. M. (2019)	Lin et al., 2019	Activating communal coping related to diabetes risk in Mexican-heritage families.	Healthware Web Tool Communal Coping Family Involvement Educational Social Supports Diet Physical Activity	2 follow-up telephone interviews 3 months and 10 months postintervention	Examining predictors will help researchers/ clinicians better understand the interpersonal processes that contribute to communication about disease risk and encouragement to change behaviors and help identify who best to target in future interventions.	• Empirical • Quantitative	Mexican	n = 447	• Mean Age 41.22	• Female • Male	Harris County, TX	• In-Home visits • Telephone interviews	Results suggest that interventions aimed at promoting healthier lifestyle in Mexican-heritage families may benefit from a 2 pronged approach: First, a family member can be recruited to act as a genomics health educator with the goal of engaging members in	Yes- Intervention porved a significant, sizable increases in new risk communication and encouragement ties after an intervention that provided personalized risk feedback to Mexican American family members.
12	**11**	Brunk, D. R., Taylor, A. G., Clark, M. L., Williams, I. C., & Cox, D. J. (2017).	Brunk et al., 2017	A culturally appropriate self-management program for Hispanic adults with type 2 diabetes and low	Self Management Diabetes Education Physical Activity	4, 2 hour weekly educational group sessions	Considered low health literacy skills when discussing lifestyle self-management programs.	• Empirical • Interview • Focus Group • Qualitative	Hispanic	n = 9	• Age Range 30- 66	• Female • Male	Charlottesville, VA	Rural community health center	• Although the participants identified barriers to changing their behaviors regarding the self-management of their T2D, they were open to finding ways to incorporate the principles of diabetes self-management. • The findings from this project	Yes- Each participant's new awareness of the ability to take control of his or her disease emerged as participants engaged in blood glucose self-monitoring at home and began feeling empowered and motivated to make lifestyle changes
13	**12**	Soto, S. C., Louie, S. Y., Cherrington, A. L., Parada, H., Horton, L. A., & Ayala, G. X. (2015)	Soto et al., 2015	An ecological perspective on diabetes self-care support, self-management behaviors, and hemoglobin A1C among Latinos	Diabetes Self-Care Self Management Social Supports Physical Activity Diabetes Management		This study is one of the first to examine the relationship of self-management behaviors and A1C with multiple sources of support among Latinos.	• Clinical Trial • Empirical • Interview • Quantitative	Latino	n = 317	Mean Age 57	• Female • Male	Southern CA	Health Centers	• Findings appear to support that the interpersonal is important for social behaviors. • Higher levels of health care support were related to more frequent fat intake. • In the current study, the health care support subscale contained items reflecting shared decision making and	Yes- • Social behaviors including those that are diet related impact the entire family and therefore require their support for change.
14	**13**	Cubillos, L., Estrada del Campo, Y., Harbi, K., Keyserling, T., Samuel-Hodge, C., & Reuland,	Cubillos et al.,2017	Feasibility and acceptability of a clinic-based Mediterranean-style diet intervention to reduce	Mediterranean Diet Educational Dietary Recommendations	• 2 months • 2 month follow up survey • phase I data was collected from February to July 2015 • phase II data collected from September 2015 to February 2016	Identifying a range of HA dietary patterns to inform the adaptation of intervention materials and exploring the acceptability of a Med-dietary pattern among HA food preparers	• Empirical • Quantitative	Hispanic Americans	n = 21	• Mean Age 52.3	• Female • Male	NC	• Academic primary care internal medicine practice • An internal medicine	• Participation rates for study visits was high and members said they will recommend to friends/family • The most commonly selected goals were "Eat at least 3 portions of nuts every week" (67%), "Eat at least 1 portion of fish every week" (52%),	Yes - • Participants understood the dietary recommendations and took steps to change their dietary behaviors (behavioral intervention) • Findings provide additional support

Table 3

Characteristics of Successful Psychosocial and Behavioral Interventions

Article #	Abbreviated Citation	Article Title	Intervention	Design	Characteristics of intervention	Duration of intervention	# of sessions	Scales	Intervention components	Findings
1	Hu et al., 2016	A Family-Based, Culturally Tailored Diabetes Intervention for Hispanics and Their Family Members	A quasi-experimental design used to examine the effects of the 8-week intervention program for participants with diabetes and their family members.	To increase knowledge of diabetes and self-efficacy, promote family support, decrease barriers to and enhancement of self-management, improve glycemic control, and improve health-related quality of life.	• Bilingual/ Bicultural registered nurses, and team members • Verbally administered scales/ questionnaires • Culturally tailored interactive modules	9 months	8 sessions	• Spoken Knowledge of Diabetes in Low Literacy Patients with Diabetes (SKILLD) verbally administered scale • Chronic Illness Resources Survey (CIRS), Spanish version • Stanford Diabetes Self-Efficacy (DSE), Spanish version • Revised Summary of Diabetes Self-Care Activities (SDSCA), Spanish version • Short International Physical Activity Questionnaire (IPAQ)	**Family diabetes intervention group** • 8 weekly interactive modules (1.5 hours each week) included diabetes psychoeducation, information, and self-management strategies, culturally tailored to account for low literacy and integrated beliefs (family focused) • 2 sessions (baseline and T4) with the family for data collection **Attention control group** • 8 weekly interactive modules (1.5hours each week) information on general health and diabetes routine care • 2 diabetes self-management educational sessions were provided at 9 months after the completion of the	• Psycho education significantly improved for both intervention and control group • Bilingual and bicultural team members provided direct linkages for recruitment, retention, and trust building • Multilevel interventions (both the individual and family), have a better chance of achieving positive outcomes (short and long term) • Multiple levels of intervention and appropriate methods will be important to delay the consequences of diabetes
2	Marquez et al., 2016	The Relationship of Social Support with Treatment Adherence and Weight Loss in Latinos with Type 2 Diabetes	• Look AHEAD (Action for Health in Diabetes) trial investigated long-term health effects of weight loss in an ethnically diverse cohort of overweight adults with type 2 diabetes • Participants were randomly assigned to an Intensive Lifestyle Intervention (ILI) or a Diabetes Support and Education	• Examine the effects of structural and functional social support on treatment adherence and weight loss among Latino males and females • To achieve an average of 7% of initial weight loss, with individual participant weight loss goals set at >10% of initial weight.	Intensive Lifestyle Intervention (ILI) is an extensive and intensive program including: meal plans, meal replacements, physical activity recommendations, and asked to keep track daily.	12 months	42 intervention sessions: • Months 1-6, group sessions for the first 3 weeks, then met individually with an interventionist the fourth week of the month • Months 7-12, biweekly group sessions and monthly individual meetings	N/A	Participants were randomly assigned to an Intensive Lifestyle Intervention (ILI) or a Diabetes Support and Education.	• Family and friends provide the most help in disease management through behaviors such as grocery shopping, food preparation, and shared diet • The relationship between social support and weight loss did not depend on sex • Males and females differed in the type of functional support received and not in the type of structural support • Treatment adherence may mediate the link between social support for physical activity and weight loss
3	Wagnera et al., 2018	Effects of stress management and relaxation training on the relationship between diabetes symptoms and affect among Latinos	Examin how within-person daily changes in affective states covaried with diabetes symptoms and whether this association was attenuated for individuals receiving SMR training compared to individuals in a control condition.	Fifty-five adult Latinos with type 2 diabetes were randomized to either one group session of diabetes education (DE-only; N = 23) or diabetes education plus eight group sessions of SMR (DE+SMR; N = 32). After treatment, participants reported five diabetes symptoms and four affective states twice-daily for seven	This study examined whether SMR dampened the link between symptoms of hyperglycemia and proximal levels of affect. We predicted that during periods of increased hyperglycemia, individuals receiving SMR training, relative to controls, would demonstrate smaller increases in negative affect.	N/A	8 sessions	• Brief Diabetes Symptom Scale • Personal Health Questionnaire (Spanish Version) • PROMIS Emotional Distress/Anxiety Scale (Spanish Version)	• Randomized trails: Both groups attended a 2.5-h group diabetes education (DE) session delivered by the study CHW in Spanish. After completing DE, participants were randomized to DE-only or DE + SMR. • 1 group session of diabetes education • or diabetes education plus 8 group sessions of SMR	Findings provide partial support for theorized mechanisms of SMR.
4	Amirehsani et al.,2019	Hispanic Families' Action Plans for a Healthier Lifestyle for Diabetes Management	Hispanic patients with T2DM and family members participating in a culturally tailored, 8-week family-based diabetes educational intervention, then chosen to participate in focus group	Focus groups (qualitive method) chosen to provide an opportunity for participants to share their stories and insights on changes in behavior	Audio taped group discussion conducted in Spanish and led by experienced, bicultural/bilingual Latina moderator. Question being "describe action plan to being healthier?"	1 day	1 session (25-30mins)	N/A	• Themes were extracted via group discussions • These findings were categorized as: o Healthier eating habits o Increasing physical activity o Watching sugar o Coping with emotions o Familial obligation o Self-efficacy	• Culturally tailored DSME/S programs positively affect/ facilitates healthier lifestyle behaviors for the entire family • Understanding the participants' perspectives assisted in understanding the potential sustainable impact of the intervention • Including Hispanic family members may be an effective mechanism for improving health for the Hispanic community
5	Wagner et al., 2015	Community health workers assisting Latinos manage stress and diabetes (CALMS-D): rationale, intervention design, implementation, and process outcomes	Stress management intervention modulates the perception and appraisal of stressors, improve stress-related coping strategies, and promote physical relaxation in hopes of improving quality of life, mood, and diabetes self-care.	Comparing enhanced standard diabetes care with enhanced standard care plus community health worker delivered stress management for Latinos with type 2 diabetes.	Core components include a culturally tailored group psychoeducational skills training and physiological relaxation skills training (cognitive behavioral)	12 months	Eight 2-hour sessions (group psychoeducation, skills training, and relaxation exercises)	• Credibility Expectancy Scale • DIALBEST Assessment • Outcome Alliance Scale • Therapeutic Alliance Scale for SM	The SM intervention consisted of • a bilingual manualized curriculum • flip chart • recorded relaxation exercises • handouts	• The SM intervention tailored with attention to the target community's characteristics and preferences, and delivered by trained and supervised CHW, was successful and well received by participants o Reporting high therapeutic alliance o Relaxation brought short term affect improvement o Diabetes knowledge increased
6	Soderlund, 2017	The Social Ecological Model and Physical Activity Interventions for Hispanic Women With Type 2 Diabetes: A Review	Using the Social Ecological Model to integrate physical activity alongside intrapersonal interventions	• The model assumes, individual behaviors are affected by, and affect the social environment. • The five levels of the SEM illustrate the factors influencing individual behavior, and include (a) intrapersonal (individual), (b) interpersonal, (c) institutional, (d) community, and (e) public policy levels of change	Socio Ecological Model (SEM) is a useful tool in exploring the individual and environmental factors contributing to behavior change.	N/A	N/A	N/A	N/A	• Intervention strategies directed at all levels of the SEM will have the greatest impact on behavioral change for Hispanic women • Socio Ecological Model was found to be a part of several various interventions towards increasing self-care in Hispanic women coping with T2DM, targeting physical activity with other diabetes self-management behaviors
7	Ramal et al., 2018	Impact of a Plant-Based Diet and Support on Mitigating Type 2 Diabetes Mellitus in Latinos Living in Medically Underserved Areas	The Diabetes Self-Management Education Program (DSMEP) consists of understanding and managing diabetes, eating healthy, monitoring blood glucose, stress management and perceived efficacy.	• A mixed-method, experimental, randomized controlled community trial design to test the effect of diet and support upon outcomes • Diet functioned as the within-group factor, while support constituted the between- group factor: those who did not receive follow-up focus group support (control group) versus those who did (experimental group)	Researchers pair the Diabetes Self-Management Education Program (DSMEP) with focus group intervention as a follow-up strategy to address the concerns of participants, identify achievable self-care.	8 months	• 8 sessions (intervention group, DSMEP + Focus) • 5 sessions (control group, DSMEP)	• Self-Efficacy for Exercise Scale • Diabetes Quality of Life Measure	**DSMEP:** • 5 DSMEP sessions • Sessions covered theoretical content (pathophysiology of diabetes; complications; treatment; diet, benefits of plant-based foods) exercise, stress management, diabetes self-management strategies, and methods to increase self-efficacy **Focus group:** • 3 sessions (1, 3, and 6 months after DSMEP) • 3- 6 participants per session, (30 - 60 mins) to determine whether facilitated follow-up support as an intervention strategy improved experimental participant outcomes. • A Spanish-speaking researcher used a semi structured interview guide to facilitate the first focus group discussion, the results of which informed the content of subsequent discussions	Seemed to have motivated both groups to adopt and continue self-care behaviors that positively impacted 3 of the variables measured in this study as significant reduction in fat intake, A1C levels, and hip circumference for both groups.

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1	**Article #**	**Abbreviated Citation**	**Article Title**	**Intervention**	**Design**	**Characteristics of intervention**	**Duration of intervention**	**# of sessions**	**Scales**	**Intervention components**	**Findings**
9	8	McEwen et al., 2017	Effects of a Family-based Diabetes Intervention on Behavioral and Biological Outcomes for Mexican American Adults	The program included 3 successive components: • Six 2-hour educational and social support group sessions conducted weekly for 6 weeks, • Three 2-hour home visits scheduled weekly for 3 weeks, and • Three 20-minute telephone calls scheduled weekly for 3 weeks	Participants were randomly assigned to either the intervention or wait list control group. Intervention Group: • The 12-week program included 3 successive components: (1) six 2-hour educational and social support group sessions conducted weekly for 6 weeks, (2) three 2-hour home visits scheduled weekly for 3 weeks, and (3) three 20- minute telephone calls scheduled weekly for 3 weeks • Delivered to 12 cohorts	The purpose of the study was to investigate the effects of a family-based self- management support intervention for adults with T2DM	6 months	3 sessions	• Acculturation Rating Scale for Mexican Americans (ARMSA-II) • Diabetes Knowledge Questionnaire (DKQ) • Newest Vital Sign • Diabetes Self-Care Activities Questionnaire • Self-Efficacy for Diabetes Scale • Diabetes Distress Scale • Fat, Fruit, and Vegetable Questionnaire	Experimental repeated measures design: • Using a 2-group, the effectiveness of a culturally tailored family-based T2DM self-management social support intervention previously refined by a Family Action Board (FAB)20 was tested • 157 dyads (participant with T2DM and family member) were randomly assigned to an intervention (education, social support, home visits, and telephone calls) or a wait list control group. (There were 83 intervention dyads, 74 control dyads)	Results support and extend prior research documenting the value of culturally relevant family-based interventions to improve diabetes self-management and substantiate the need for intensive, longer, tailored interventions to achieve glycemic control.
10	9	Garci a et al., 2015	Home-based diabetes symptom self-management education for Mexican Americans with type 2 diabetes	• Testing the feasibility and effectiveness of an RN-delivered symptom-focused diabetes self- management intervention in participants' home. • A diabetes symptom self-management educational intervention designed for Mexican Americans. • A new way to motivate patients to take steps necessary to achieve and maintain glucose levels within a normal range.	**Intervention group:** o 6 weekly in-home, interactive, one-on-one educational and behavior modification sessions with a bilingual registered nurse (RN) The curriculum teaches three important steps to diabetes symptom self-management: o recognize that their symptoms may be related to their blood glucose levels. o act on the symptoms by checking their blood glucose levels.	• A new approach to diabetes self-management education, in which symptom identification and treatment were foundational components • The symptom-focused one-on-one sessions allowed for individualized education that addressed the patients' symptom concerns and helped them understand diabetes self-management in the context of symptom relief	6 months	8 sessions, 30-60 mins (intervention group)	• Diabetes Symptom Self-Care Inventory's (DSSCI) • Spoken Knowledge in Low Literacy in Diabetes (SKILLD) Scale • The Diabetes-39 • The Perceived Diabetes Self-Management Scale (PDSMS) • The Diabetes Empowerment Scale (DES)	• Collect personal clinical, and psychosocial measures of data • An RN nurse administered and collected this information at the patient's home	• Participants were satisfied with the sessions and the method of delivery. • Intervention supports the importance of focusing on patients' diabetes symptoms: o helps patients understand the immediate effects of their behaviors on symptoms/ diabetes status o symptom-focused approach was effective in increasing awareness of the connection between bodily sensations, diabetes status and behaviors • Delivering the intervention in participants' homes allowed RNs to tailor the information to
11	10	Lin et al., 2019	Activating communal coping related to diabetes risk in Mexican-heritage families.	**Family Healthware** is a Web-based tool that assesses familial risk for 6 common complex diseases and provides a personalized prevention plan.	Using a family health history–based intervention, providing house-hold members with personalized feedback about their familial risk for T2D.	Input the family health information participants provided at baseline into Family Healthware to obtain a pedigree and supplementary feedback including personalized risk assessment and tailored behavioral recommendations about lifestyle management and preventive screening for T2D and comorbid conditions.	10 months	3 sessions	N/A	• Baseline interview (bilingual interviewers) during in home visits • 2 weeks after interview, packet containing individual feedback was generated by Family Healthware • Follow up telephone calls were placed at o 3 months o 10 months	• Using social network methodologies, we explore individual and interpersonal-level predictors of new ties, postintervention, that represent communication about T2D risk and encouragement of another family member to exercise regularly, maintain a healthy weight, and eat a healthy diet. • Examining these predictors will help researchers and clinicians better understand the interpersonal processes that contribute to communication about disease risk and encouragement to change behaviors and help identify who best to target in future interventions.
12	11	Brunk et al., 2017	A culturally appropriate self-management program for Hispanic adults with type 2 diabetes and low health literacy skills	A lifestyle modification program referred to as GEM (Glycemic load diet, Exercise, and self-blood glucose Monitoring)	• A descriptive qualitative study design (phenomenological approach) focusing on an educational program that instructed on low glycemic food choices, meaningful glucose self-monitoring, and physical activity to decrease blood glucose spikes. • Participants' feedback was recorded during focus group sessions.	• GEM Model identifies five levels for assessment and intervention to address diabetes self-management, with the levels being: o cognitive, o attitudinal, o instrumental, o behavioral, and o social levels. • These concepts anchored the lifestyle modification educational program and guided the data collection and explication by providing a framework for initial coding of the data.	1 month	4 sessions	N/A	• Data were gathered through focus group sessions regarding the cultural applicability of the lifestyle modification program. • 4 weekly, 2-hour evening education sessions were conducted during which the contents of the GEM manual were presented in Spanish in an interactive format (pictures replacing words and diagrams wherever possible)	• GEM can help with the Mexican-style diet can be modified to a lower glycemic load diet that is acceptable to this population. • Strategies presented to the participants, including using fiber, fats, vinegar, and cinnamon as "sugar blockers," were well received as one way to consume small amounts of the familiar and common foods (rice and tortillas) prevalent in the Mexican culture.
13	12	Soto et al., 2015	An ecological perspective on diabetes self-care support, self-management behaviors, and hemoglobin A1C among Latinos	This quantative, empirical clinical trial study examines the role of self, interpersonal (family/friend), and organizational (health care) support in performing diabetes-related self-management behaviors and hemoglobin A1C (A1C) levels among rural Latinos with type 2 diabetes.	Cross-sectional study used baseline data from a randomized controlled trial in rural southern California that included 336 clinic patients with diabetes. Data came from Puentes hacia una mejor vida (Puentes; Bridges to a Better Life). 1 of 8 international studies testing models of peer support for diabetes	• Cross-sectional data from baseline interviews and medical records were used from a randomized controlled • Self- management behaviors included fruit and vegetable intake, fat intake, physical activity, glucose monitoring, daily examination of feet, and medication adherence.	12 months	N/A	• Morisky Medication Adherence Scale • Chronic Illness Resource Survey (CIRS)	• Randomly sampled using the medical charts from 3 of 9 clinics that are part of Clínicas de Salud del Pueblo • 50% of the patients were randomly sampled and mailed letters of invitation followed by a telephone call from a research staff member • Patients who agreed were then screened for eligibility	• Higher levels of self-support were significantly associated with eating fruits and vegetables most days/week, eating high-fat foods few days/week, engaging in physical activity most days/week, daily feet examinations, and self-reported medication adherence. • Family/friend support was significantly associated with eating fruits and vegetables and engaging in physical activity most days/week. • Health care support was significantly associated
14	13	Cubillos et al.,2017	Feasibility and acceptability of a clinic-based Mediterranean-style diet intervention to reduce cardiovascular risk for Hispanic Americans with type 2 diabetes	PREDIMED is a large Spanish primary prevention trial, who were at high risk for cardiovascular disease, but otherwise healthy.	A (clinical pilot), intervention that promoted a Medstyle dietary pattern was given to all participants via face-to-face counseling sessions and 2 telephone counseling sessions.	A major focus on improving consumption of high-quality dietary fats (polyunsaturated and monounsaturated fats primarily from plant sources and fish) and carbohydrates (fruits, vegetables, and whole grains)	2 months	4 sessions: • 2 in person • 2 telephone	• Marin Short Acculturation Scale • PREDIMED dietary screener	• Focus on improving consumption of high-quality dietary fats (polyunsaturated, monounsaturated fats primarily from plant sources, fish) and carbohydrates (fruits, vegetables, and whole grains)- modified for health (T2DM) and cultural appropriateness • This study is Phase II (clinical pilot), an intervention promoting a Medstyle dietary pattern was given to all participants via 2 face-to-face counseling sessions and 2 telephone counseling sessions. o Interviews were used to better understand patients' food patterns and feedback on purposed intervention	• Significant improvement in self-reported adherence to an adapted Mediterranean-style (Med-style) diet. • Greater adherence to a Med-style dietary pattern was also observed in the intervention group • HAs (post-menopausal women living with diabetes) benefit from a patient-centered approach that is designed to support behavioral change (ie.patient-centered medical homes)

APPENDIX A

Preliminary Search Terms

LIST OF SEARCH TERMS

*Each Primary Search Term can have synonyms or alternate forms to use with the "OR" operator in your searches

Search Term ID#	Primary Term	Synonyms/ Alternate Forms	Notes
01	Latinx	"Latinos" OR "Hispanics" OR "Chicanos" OR "Latinas" OR "Mexican"	Consider "Latinx" is a newer term, and see if this interferes in gathering app. data.
02	Type 2 Diabetes	"Type 2 Diabets Mellitus" OR "T2DM"	
03	Interventions	"Treatment" OR "Intervention" OR "Therapy" OR "Management" OR "Rehabilitation" AND "Therapy" OR "Treatment" OR "Intervention" OR "Counseling" OR "Psychotherapy"	
04	Disparities	"Disparity" OR "Inequities" OR "Inequality" OR "Bias" OR "Disproportionality"	

APPENDIX B

Screening and Selection Record

SCREENING AND SELECTION RECORD

PHASE 1: Title/Keywords/Abstract (Screening) PHASE 2: Full-Text Review (Eligibility) PHASE 3: Final Decision (Selection)

DECISION CODES: INCLUDE/CONTINUE TO ABSTRACT/CONTINUE TO FULL TEXT/UNDECIDED/EXCLUDE (IN/CFT/CAB/UN/EX)
CRITERIA CODES: (IS THE CRITERIA MET?) YES/UNCLEAR/NO (Y/UC/NO)

ABBREVIATED CITATION	ABBREVIATED TITLE	DATABASES/ SOURCES	TITLE AND/OR KEYWORD SCREEN: DECISION - DATE	ABSTRACT SCREEN: DECISION - DATE	FULL-TEXT SCREEN?	INCL (SO): Peer Reviewed	2015-2021	18>	INCL (RQ2)	US Located	Research Variable 1

Research Varable 2	Research Variable 3	Ethnicity	Gender	Location	Methodology	Successful Intervention	SECONDARY/ CONFIMATORY DECISION	FINAL DECISION	FINAL DECISION DATE	DECISION NOTES

APPENDIX C

Data Collection Form

Data Collection and Extraction Form

Document ID#

Authors and Year *(last names of authors and year of publication, e.g., Johnson, Jones, and Jackson 2011)*

Full Document Title

Research Variables

Notes:

1. General Information

1.	**Date form completed** *(dd/mm/yyyy)*	
2.	**Initials/ID of person extracting data**	
3.	**Source/Publication Type** *(journal, book, conference, report, dissertation, abstract, etc.)*	
4.	**Source Name** *(Title of Journal, Book, Organization, etc.)*	
5.	**Publication Status** *(Published, Unpublished)*	
6.	**Document Language**	
7.	**Intervention used**	
8.	**Intervention characteristics** -Quality or feature of intervention	
9.	**Notes:**	

2. Design Characteristics and Methodological Features

	Descriptions as stated in report/paper	**Location in tex**

		(pg & ¶/fig/table)
10. **Aim of study**		
11. General Method (Quant, Qual, Mixed)		
12. Design or Specific Research Approach		
13. Notes:		

3. Assessment of Research Variables

RESEARCH VARIABLES	**How Assessed** *(Measure, Observation, Interview Question, Archival, etc.)*	**Reliability/Validity/Utility**	**Location in text** *(pg & ¶/fig/table)*
14. **Race/Ethnicity**.			
15. **T2DM** insulin dependent, diabetes mellitus, niddm, non insulin dependent. etc.			
16. **Interventions** behavioral/psychosocial			
17. **Disparities**			
18. Notes:			

4. Study Participant Characteristics and Recruitment

	Description as stated in report/paper	**Location in text** *(pg & ¶/fig/table)*
19. Population studied? Race/Ethnicity?		
20. Recruitment Methods		
21. Sample Size		
22. **Age**		

23. Gender		
24. T2DM		
25. Comorbidity		
26. Other tx received?		
27. Located in the US?		
28. Notes:		

5. Setting Characteristics

	Descriptions as as stated in report/paper	**Location in text** *(pg & ¶/fig/table)*
29. Study Location: hospitals/mental health community, clinic, school etc.		
30. Data Collection How was it gathered within the setting?		
31. Notes:		

6. Analyses Conducted

	Description as stated in report/paper	**Location in text** (pg & ¶/fig/table)
32. **Descriptive Statistics used**		
33. **Inferential Statistics used**		
34. Qualitative Analyses conducted		
35.		

7. Results

	Description as stated in report/paper	Location in text *(pg & ¶/fig/table)*
36. Brief summary of results		
37. **Outcome**		
38. Points of time for measures (duration of measures, pre-post?)		
39. Validity of tools.		
40. Effectiveness? Defined by author		
41. Notes:		

8. Conclusions and Follow-up

	Description as stated in report/paper	Location in text *(pg & ¶/fig/table)*
42. Key conclusions of study authors		
43. Study Author's Recommendations for Future Research		
44. Does the study directly address the review question?		
45. Your Take-Aways: General		
46. Study Limitations (to inform Quality Appraisal)		
47. Notes:		

APPENDIX D

Quality Appraisal Form

INDIVIDUAL STUDY QUALITY ASSESSMENT

Date: **Reviewer:**

Author: **Year:**

Study ID#

1. **Methodology:** Quantitative ☐ Qualitative☐ Mixed Methods☐

2. **Specific Design/Inquiry Approach**:

RATING SCALE: Strong=3 Good/Adequate=2 Weak=1 Missing=0 N/A

3. **Strength of Literature Foundation and Rationale for Study:**
   (POSSIBLE CONSIDERATIONS current and relevant references, background literature sufficiently comprehensive, Need/Rationale for study clearly stated, etc.)

   ☐Score=

4. **Clarity and specificity of Research Aims/Objectives/Questions:**

   ☐Score=

5. **Quality of research design or methodological approach:**
   (POSSIBLE CONSIDERATIONS: provides rationale for design chosen, appropriateness for research questions, clear description of design and methodological approach, strength of design characteristics utilized (e.g., randomization, blinding, triangulation, etc.), potential confounds identified and addressed in some way, consideration of internal and external validity in design, specific design-based "risk of bias" criteria).

   ☐Score=

6. **Sample Selection and Characteristics:**
   (POSSIBLE CONSIDERATIONS: adequacy of sample size in context of design, detailed description of sample characteristics, representativeness of sample, adequacy of sample characteristics in the context of research aims, detailed description of recruitment and selection of participants, extent of selection or sample bias).

   ☐Score=

7. **Measures / Data Collection Tools:**
   (POSSIBLE CONSIDERATIONS: rationale for selection, appropriateness for assessing variables, development of new tool clearly described, psychometric properties (reliability, validity, utility) described, adequacy of psychometric properties, sufficiently comprehensive, etc).

   ☐Score=

8. **Data Collection:**
   (POSSIBLE CONSIDERATIONS: data collection procedures clearly described, intervention strategies and implementation described in detail, quality of data collected, attrition, etc).

   ☐Score=

9. **Analysis of Data:**
(POSSIBLE CONSIDERATIONS: appropriateness of analysis for research questions and type of data, power and effect size presented, results presented clearly and comprehensively, etc).

☐Score=

10. **Discussion of Study Limitations:**
(POSSIBLE CONSIDERATIONS: identifies and discusses limitations in the context of design/strategy utilized (e.g., various forms of bias, internal validity, external validity (generalizability), ecological validity, transferability, credibility, transparency, etc.), comprehensiveness of limitations identified).

☐Score=

11. **Consideration of culture and diversity:**
(POSSIBLE CONSIDERATIONS: attention to diversity within sample, includes culturally appropriate methods and tools, avoids biased language, uses appropriate terminology, etc).

☐Score=

12. **OVERALL RATING: EXEMPLARY (all "3"s)☐ STRONG (mostly "3"s)☐ GOOD/ADEQUATE (mostly "2"s)☐ WEAK (mostly "1"s)☐**

13. **MEETS CUT OFF SCORE OF 18> ☐**

APPENDIX E

Database Table

	A	B	C	D	E	F	G	H	I	J
1	**Article #**	**Author/Year**	**Abbreviated Citation**	**Title**	**Research Variables**	**Source Name (Title of Journal, Book, Organization, etc.)**	**Disparities**	**Intervention used**	**Characteristics**	**Aim of study**
2	#									
3										
4										
5										

	K	L	M	N	O	P	Q	R	S
1	**General Method (Quant, Qual, Mixed)**	**Research variable: Latinx**	**Research variable: T2DM**	**Research variable: interventions**	**Population studied: Race/Ethnicity**	**Recruitment methods:**	**Sample Size**	**Age: Adult**	**Gender**
2									
3									
4									
5									

	T	U	V	W	X	Y	Z	AA
1	**Comorbidity: Were there other dx?**	**Add. treatment**	**Location**	**Setting**	**Data Collection**	**Brief summary of results:**	**Outcome:**	**Successes**
2								
3								
4								
5								

APPENDIX F

Included Studies

Abbreviated Reference	APA Citation
Amirehsani et al.,2019	Amirehsani, K. A., Hu, J., Wallace, D. C., Silva, Z. A., & Dick, S. (2018). Hispanic families' action plans for a healthier lifestyle for diabetes management. The Diabetes Educator, 45(1), 87–95. https://doi.org/10.1177/0145721718812478
Benavides-Vaello & Brown, 2016	Benavides-Vaello, S., & Brown, S. A. (2016). Sociocultural construction of food ways in low-income Mexican-American women with diabetes: A qualitative study. Journal of Clinical Nursing, 25(15-16), 2367–2377. https://doi.org/10.1111/jocn.13291
Brunk et al., 2017	Brunk, D. (2017). A culturally appropriate self-management program for Hispanic adults with type 2 diabetes and low health literacy skills. https://doi.org/10.18130/v33g1f
Cobb et al., 2017	Cobb, C. L., Meca, A., Xie, D., Schwartz, S. J., & Moise, R. K. (2017). Perceptions of legal status: Associations with psychosocial experiences among undocumented Latino/a immigrants. Journal of Counseling Psychology, 64(2), 167–178. https://doi.org/10.1037/cou0000189
Cubillos et al.,2017	Cubillos, L., Estrada del Campo, Y., Harbi, K., Keyserling, T., Samuel-Hodge, C., & Reuland, D. S. (2017). Feasibility and acceptability of a clinic-based Mediterranean-style diet intervention to reduce cardiovascular risk for Hispanic Americans with type 2 diabetes. The Diabetes Educator, 43(3), 286–296. https://doi.org/10.1177/0145721717706030
Darghouth et al.,2015	Darghouth, S., Brody, L., & Alegría, M. (2015). Does marriage matter? marital status, family processes, and psychological distress among Latino men and women. Hispanic Journal of Behavioral Sciences, 37(4), 482–502. https://doi.org/10.1177/0739986315606947
García et al., 2015	Garcia, A. A., Brown, S. A., Horner, S. D., Zuniga, J., & Arheart, K. L. (2015). Home-based diabetes symptom self-management education for Mexican Americans with type 2 diabetes. Health Education Research, 30(3), 484–496. https://doi.org/10.1093/her/cyv018
Garcia et al.,2015	Garcia, L., Lee, A., Hazzouri, A. Z., Neuhaus, J., Epstein, M., & Haan, M. (2015). The impact of neighborhood socioeconomic position on prevalence of diabetes and Prediabetes in older Latinos: The sacramento area latino study on aging. Hispanic Health Care International, 13(2), 77–85. https://doi.org/10.1891/1540-4153.13.2.77
Gonzalez-Guarda et al., 2016	González-Guarda, R. M., McCabe, B. E., Leblanc, N., De Santis, J. P., & Provencio-Vasquez, E. (2016). The contribution of stress, cultural factors, and sexual identity on the substance abuse, violence, HIV, and depression syndemic among Hispanic men. Cultural Diversity and Ethnic Minority Psychology, 22(4), 563–571. https://doi.org/10.1037/cdp0000077
Hu et al., 2016	Hu, J., Amirehsani, K. A., Wallace, D. C., McCoy, T. P., & Silva, Z. (2016). A family-based, culturally tailored diabetes intervention for Hispanics and their family members. The Diabetes Educator, 42(3), 299–314. https://doi.org/10.1177/0145721716636961

Abbreviated Reference	APA Citation
LeBrón et al., 2017	LeBrón, A. M., Spencer, M., Kieffer, E., Sinco, B., Piatt, G., & Palmisano, G. (2020). Correlates of interpersonal ethnoracial discrimination among Latino adults with diabetes: Findings from the reach Detroit study. Microaggressions and Social Work Research, Practice and Education, 49–68. https://doi.org/10.4324/9780429460531-4
Lin et al., 2019	Lin, J., Myers, M. F., Wilkinson, A. V., & Koehly, L. M. (2019). Activating communal coping related to diabetes risk in Mexican-heritage families. Family & Community Health, 42(4), 245–253. https://doi.org/10.1097/fch.0000000000000234
Marquez et al., 2016	Marquez, B., Anderson, A., Wing, R. R., West, D. S., Newton, R. L., Meacham, M., Hazuda, H. P., Peters, A., Montez, M. G., Broyles, S. T., Walker, M., & Evans-Hudsnall, G. (2016). The relationship of social support with treatment adherence and weight loss in Latinos with type 2 diabetes. Obesity, 24(3), 568–575. https://doi.org/10.1002/oby.21382
McEwen et al., 2017	McEwen, M. M., Pasvogel, A., Murdaugh, C., & Hepworth, J. (2017). Effects of a family-based diabetes intervention on behavioral and biological outcomes for Mexican American adults. The Diabetes Educator, 43(3), 272–285. https://doi.org/10.1177/0145721717706031
Organista et al., 2017	Organista, K. C., Ngo, S., Neilands, T. B., & Kral, A. H. (2016). Living conditions and psychological distress in Latino migrant day laborers: The role of cultural and community protective factors. American Journal of Community Psychology, 59(1-2), 94–105. https://doi.org/10.1002/ajcp.12113
Ramal et al., 2018	Ramal, E., Champlin, A., & Bahjri, K. (2017). Impact of a plant-based diet and support on mitigating type 2 diabetes mellitus in Latinos living in medically underserved areas. American Journal of Health Promotion, 32(3), 753–762. https://doi.org/10.1177/0890117117706793
Ramirez &Carmona, 2018	Ramírez, A. S., & Arellano Carmona, K. (2018). Beyond fatalism: Information overload as a mechanism to understand health disparities. Social Science & Medicine, 219, 11–18. https://doi.org/10.1016/j.socscimed.2018.10.006
Sanchez-Johnsen et al., 2017	Sanchez-Johnsen, L., Craven, M., Nava, M., Alonso, A., Dykema-Engblade, A., Rademaker, A., & Xie, H. (2017). Cultural variables underlying obesity in Latino men: Design, rationale and participant characteristics from the Latino Men's Health initiative. Journal of Community Health, 42(4), 826–838. https://doi.org/10.1007/s10900-017-0324-9
Soderlund, 2017	Soderlund, P. D. (2016). The social ecological model and physical activity interventions for Hispanic women with type 2 diabetes: A Review. Journal of Transcultural Nursing, 28(3), 306–314. https://doi.org/10.1177/1043659616649671
Soto et al., 2015	Soto, S. C., Louie, S. Y., Cherrington, A. L., Parada, H., Horton, L. A., & Ayala, G. X. (2015). An ecological perspective on diabetes self-care support, self-management behaviors, and hemoglobin a1c among Latinos. The Diabetes Educator, 41(2), 214–223. https://doi.org/10.1177/0145721715569078
Wagnera et al., 2018	Wagner, J., Armeli, S., Tennen, H., Bermudez-Millan, A., & Pérez-Escamilla, R. (2018). Effects of stress management and relaxation training on the relationship between diabetes symptoms and affect among Latinos. Psychology & Health, 33(9), 1172–1190. https://doi.org/10.1080/08870446.2018.1478975

Abbreviated Reference	APA Citation
Wagner et al., 2015	Wagner, J., Bermudez-Millan, A., Damio, G., Segura-Perez, S., Chhabra, J., Vergara, C., & Perez-Escamilla, R. (2015). Community Health Workers Assisting latinos manage stress and diabetes (calms-D): Rationale, intervention design, implementation, and Process Outcomes. Translational Behavioral Medicine, 5(4), 415–424. https://doi.org/10.1007/s13142-015-0332-1

APPENDIX G

Key Characteristics of Included Studies

#	Author and Year	Title	Methodology	Design	Sample Size	Sample Characteristics	Location of Study
1	Amirehsani et al., 2019	Hispanic Families' Action Plans for a Healthier Lifestyle for Diabetes Management	• Empirical Study • Qualitative Study	• Interview • Focus Group	n = 84	• Latino Hispanic • Mean Age 44.2 • Female • Male	Greensboro, NC
2	Benavides-Vaello & Brown, 2016	Sociocultural Construction of food ways in low income Mexican American women with Diabetes: A qualitative study.	• Quantitative • Qualitative	• Ethnographic Study • Interview	n = 12	• Mexican • Mean Age 52.8 • Female	Starr County, TX
3	Brunk et al., 2017	A culturally appropriate self-management program for Hispanic adults with type 2 diabetes and low health literacy skills	• Empirical Study • Qualitative Study	• Interview • Focus Group	n = 9	• Hispanic • Age Range 30- 66 • Female • Male	Charlottesville, VA
4	Cobb et al., 2017	Perceptions of Legal Status: Associations with Psychosocial Experiences among Undocumented Latinos/as	• Quantitative • Qualitative	• Cross Sectional	n = 140	• Hispanic • Age Range 18-60 • Female • Male	Houston, TX Little Rock, AR
5	Cubillos et al.,2017	Feasibility and acceptability of a clinic-based Mediterranean-style diet intervention to reduce cardiovascular risk for Hispanic Americans with type 2 diabetes	• Empirical Study • Quantitative Study	• Pilot Study	n = 21	• Hispanic Americans • Mean Age 52.3 • Female • Male	North Carolina
6	Darghouth et al., 2015	Does Marriage Matter? Marital Status, Family Processes, and Psychological Distress Among Latino Men and Women	• Quantitative • Qualitative	• Interview	n = 868	• Mexican • Cuban • Puerto Rican • Latino • Age Range 18-65 • Female	Ann Arbor, MI

#	Author and Year	Title	Methodology	Design	Sample Size	Sample Characteristics	Location of Study
7	Garcia et al., 2015	The Impact of Neighborhood Socioeconomic Position on Prevalence of Diabetes and Prediabetes in Older Latinos: The Sacramento Area Latino Study on Aging	• Quantitative • Qualitative	• Cross Sectional	n = 1777	• Latino • Age Mean 70.7 • Female • Male	Sacramento, CA
8	Garcı́a et al., 2015	Home-based diabetes symptom self-management education for Mexican Americans with type 2 diabetes	• Empirical Study • Quantitative Study	• Pilot Trial • Survey/ Questionnaire	n = 72	• Hispanic • Mexican American • Mean Age 49.6 • Female • Male	Central TX
9	Gonzalez-Guarda et al., 2016	The Contribution of Stress, Cultural Factors, and Sexual Identity on the Substance Abuse, Violence, HIV, and Depression Syndemic Among Hispanic Men	• Quantitative • Qualitative	• Cross sectional	n = 164	• Hispanic • Cuban • Age Range 18-55 • Male	Miami-Dade County, FL
10	Hu et al., 2016	A Family-Based, Culturally Tailored Diabetes Intervention for Hispanics and Their Family Members	• Empirical Study • Quantitative Study	• Follow-up Study • Interview	n = 186	• Hispanic • Mean Age 49 • Female • Male	Central Regions, NC
11	LeBrón et al., 2017	Correlates of Interpersonal Ethnoracial Discrimination Among Latino Adults with Diabetes: Findings from the REACH Detroit Study	• Quantitative • Qualitative	• Intervention/Experimental • Interview	n = 403	• Mexican • Chicano • Age Range 48.85 • Male	Detroit, MI
12	Lin et al., 2019	Activating communal coping related to diabetes risk in Mexican-heritage families.	• Empirical Study • Quantitative Study	• Risk Assessment Intervention/Experimental	n = 447	• Mexican • Mean Age 41.22 • Female • Male	Harris County, TX

#	Author and Year	Title	Methodology	Design	Sample Size	Sample Characteristics	Location of Study
13	Mann-Jackson et al., 2018	The Health Impact of Experiences of Discrimination, Violence, and Immigration Enforcement Among Latino Men in a New Settlement State	• Quantitative • Qualitative	• Interview	n = 247	• Mexican • Hispanic • Age Range 18-64 • Male	North Carolina
14	Marquez et al., 2016	The Relationship of Social Support with Treatment Adherence and Weight Loss in Latinos with Type 2 Diabetes	• Empirical Study • Quantitative Study	• Pilot trial • Randomized Control Trial	n = 278	• Latino • Mean Age 57 • Female • Male	San Diego, CA
15	McEwen et al., 2017	Effects of a Family-based Diabetes Intervention on Behavioral and Biological Outcomes for Mexican American Adults	• Empirical Study • Quantitative Study	• Randomized Control Trial	n = 157	• Mexican Americans • Mean Age 53.3 • Female • Male	Arizona
16	Organista et al., 2017	Living Conditions and Psychological Distress in Latino Migrant Day Laborers: The Role of Cultural and Community Protective Factors	• Quantitative • Qualitative	• Cross Sectional Survey	n = 344	• Mexican • Guatemalan • Salvadoran • Honduran • Latino • Age Range 18-81 • Male	San Francisco, CA
17	Ramal et al., 2018	Impact of a Plant-Based Diet and Support on Mitigating Type 2 Diabetes Mellitus in Latinos Living in Medically Underserved Areas	• Empirical Study • Qualitative Study • Quantitative Study	• Interview • Focus Group	n = 42	• Latinos • Mean Age 53 • Female • Male	San Bernadino, CA
18	Ramirez & Carmona, 2018	Beyond Fatalism: Information Overload as a Mechanism to Understand Health Disparities	• Quantitative • Qualitative	• Interview • Survey/ Questionnaire	n = 24	• Mexican • Age Range 18-29 • Female	Central California cities
#	Author and Year	Title	Methodology	Design	Sample Size	Sample Characteristics	Location of Study
19	Sanchez−Johnsen et al., 2017	Cultural Variables Underlying Obesity in Latino Men: Design, Rationale and Participant Characteristics from the Latino Men's Health Initiative	• Quantitative • Qualitative	• Interview • Survey/ Questionnaire	n = 203	• Mexican • Puerto Rican • Mean age 31.35 • Male	Chicago, IL
20	Soderlund, 2017	The Social Ecological Model and Physical Activity Interventions for Hispanic Women With Type 2 Diabetes: A Review	• Literature Review	• Intervention/Experimental • Quasi-experimental	N/A	• Latino • Hispanic • Mexican- American • Age Range 18 + • Female	• Illinois • Arizona • Texas • Colorado • North Carolina • Boston • Michigan
21	Soto et al., 2015	An ecological perspective on diabetes self-care support, self-management behaviors, and hemoglobin A1C among Latinos	• Empirical Study • Quantitative Study	• Clinical Trial • Interview	n = 317	• Latino • Mean Age 57 • Female • Male	Southern California
22	Wagner et al., 2015	Community health workers assisting Latinos manage stress and diabetes (CALMS-D): rationale, intervention design, implementation, and process outcomes	• Empirical Study • Quantitative Study	• Intervention/Experimental	n= 107	• Latino • Hispanic • Puerto Rican • Mean Age 60.32 • Female • Male	Hartford, CT
23	Wagnera et al., 2018	Effects of stress management and relaxation training on the relationship between diabetes symptoms and affect among Latinos	• Empirical Study • Quantitative Study	• Intervention/Experimental	n= 55	• Latino • Mean Age 57 • Female • Male	Connecticut

APPENDIX H

GPS IRB Non-Human Subjects Determination Notice

PEPPERDINE UNIVERSITY

Graduate & Professional Schools Institutional Review Board

June 10, 2021

Protocol #: **61021**

Project Title: A Systematic Review of Health Disparities and the Psychosocial and Behavioral Interventions for Type 2 Diabetes Within LatinX Communities

Dear Elisa:

Thank you for submitting a "GPS IRB Non-Human Subjects Notification Form" for *A Systematic Review of Health Disparities and the Psychosocial and Behavioral Interventions for Type 2 Diabetes Within LatinX Communities* project to Pepperdine University's Institutional Review Board (IRB) for review. The IRB has reviewed your submitted form and all ancillary materials. Upon review, the IRB has determined that the above titled project meets the requirements for *non-human subject research* under the federal regulations 45 CFR 46.101 that govern the protection of human subjects.

Your research must be conducted according to the form that was submitted to the IRB. If changes to the approved project occur, you will be required to submit *either* a new "GPS IRB Non-Human Subjects Notification Form" or an IRB application via the eProtocol system (httpw://irb.pepperdine.edu) to the Institutional Review Board.

A goal of the IRB is to prevent negative occurrences during any research study. However, despite our best intent, unforeseen circumstances or events may arise during the research. If an unexpected situation or adverse event happens during your investigation, please notify the IRB as soon as possible. We will ask for a complete explanation of the event and your response. Other actions also may be required depending on the nature of the event. Details regarding the timeframe in which adverse events must be reported to the IRB and documenting the adverse event can be found in the *Pepperdine University Protection of Human Participants in Research: Policies and Procedures Manual* at https://community.pepperdine.edu/irb/policies/.

Please refer to the protocol number denoted above in all further communication or correspondence related to this approval.

On behalf of the IRB, we wish you success in this scholarly pursuit.

Sincerely,

Institutional Review Board (IRB)
Pepperdine University

cc: Mrs. Katy Carr, Assistant Provost for Research
Dr. Judy Ho, Graduate School of Education and Psychology IRB Chair