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Historical Trauma, Contemporary Trauma, and Type-2 Diabetes Self-Management Among American Indian/Alaska Native Women

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Abstract

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MA, Southern Utah University, 2011

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology

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Abstract

Endemic Type-2 Diabetes Mellitus (T2DM) is one of the leading causes of mortality among American Indian/Alaska Natives (AI/ANs). Trauma and stress have been shown to impact the progression of diabetes that could negatively impact health-related behaviors. Previous studies have not examined the relationship between historical and contemporary trauma and T2DM self-management among AI/AN women. The purpose of this research was to examine the relationship between historical loss, historical loss associated symptoms, stressful life events, microaggressions (microinsults and microinvalidations), and T2DM self-management (glucose management, dietary control, physical activity, healthcare use) among AI/AN women with diabetes. Historical trauma theory was the basis of this study and explained the consequences of colonization resulting in contemporary trauma that affects physical and mental health. A cross-sectional survey design included data from a convenience sample of 209 AI/AN adult woman. Multiple regression analyses showed that greater experiences with microinvalidations predicted poorer glucose management, less physical activity, less healthcare use, and poorer overall T2DM self-management. The study demonstrated that contemporary trauma (stressful life events and microinvalidations) had a significant and negative impact on T2DM self-management among AI/AN women. These results could improve T2DM self-management and the high levels of mortality, morbidity, costs, and quality of life among AI/AN women. The findings may also be used by educators and healthcare providers to promote positive social change by integrating cultural-sensitive approaches to the treatment of AI/AN groups.

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Dedication

I would like to pay special tribute to Clarence L. Jolley, my husband and friend who provided me the time, and encouragement to reach my goal before passing away on 25 September 2019 – merci and I love you. I dedicate the diabetes portion of my study to Petrus Jacobus Reyneke, my first husband and eternal companion who inspired my interest. My deepest gratitude is extended to Dr. Anthony Perry, my Chair and friend who assisted me to attain a written scholarly presentation of my thoughts on a higher level in my academic career – thank you for your incredible patience. Finally, I dedicate the culturally-oriented inspiration and direction to Dr. Melinda Garcia and Dr. Joseph Trimble as American Indian Psychologists.

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Chapter 1: Introduction to the Study

This research study examined the relationship between historical trauma, (historical loss and historical loss associated symptoms), contemporary trauma (microinsults, microinvalidations, and stressful life events), and Type-2 Diabetes Mellitus (T2DM) self-management among American Indian and Alaska Native (AI/AN) women. There are 6.8 million AI/ANs (18 years and older) who have T2DM (15.9%) compared to non-Hispanic White populations (7.3%) in the United States (American Diabetes Association [ADA], 2017; Centers for Disease Control and Prevention [CDC], 2016; Census.gov, 2018). This study was significant because AI/ANs have the highest rates of T2DM in the world and need culturally-oriented diabetes training to self-manage and facilitate the knowledge, skill, and ability for proper self-care (Booth, Nourian, Weaver, Gull, & Kamimura, 2017; Esparza-Romero et al., 2015; Velazquez, Scarton, O'Neal, & Wilkie, 2018). T2DM self-management, if neglected, would significantly increase the higher mortality, morbidity, poor quality of life, and high healthcare costs among AI/ANs (Velazquez et al., 2018; Wilkinson, Whitehead, & Ritchie, 2014).

Historical trauma refers to the legacies of historical injustices, racism, and social inequities transmitted through generations that cause subsequent generations to suffer anger, grief, shame, emotional detachment, addiction, and the use of detrimental stress-coping methods (Hartmann & Gone, 2012; Lomawaima, Brayboy, & McCarty, 2018; Walters & Simoni, 2002). Historical trauma has resulted in contemporary stressors suffered by AI/ANs that contribute to the many other anxiety disorders experienced later in life (Elm, Walls, & Aronson, 2019; Tamayo, Herder, & Rathmann, 2010). Common

mental health issues and psychosocial stressors due to contemporary stressors also have been found to contribute to diabetes progression and have the potential to interfere with successful interventions such as T2DM self-management among AI/ANs (Jang, Johnson, D'Eramo-Melkus, & Vorderstrasse, 2018; Rosas et al., 2016). Historical trauma effects of oppression, violence, and abuse is communicated to succeeding generations and has been shown to facilitate further trauma by replacing self-identification with historical trauma identification (Burrage, Gagnon, & Bermann, 2018; Prager, 2016). In addition, AI/ANs are sensitive to contemporary discrimination and racism referred to as microaggressions that are comprised of microinsults, microinvalidations, and microassaults (Bryant-Davis, 2018; Butler, 2016; Comas-Diaz, 2016; Fleischer, 2017; Helms, Nicolas, & Green, 2012; Ong, 2013; Ong & Burrow, 2017; Sue, 2007; Walls, Gonzales, Glaney & Onello, 2015; Williston, Martinez, & Abdullah, 2019).

Contemporary trauma, in the form of a microaggression, is the consequence of historical trauma experienced intergenerationally, and is associated with AI/AN's poverty, smoking, drug abuse, depression, risky relationships, obesity, and racial discriminations (Bryant-Davis, 2018; Beasely, Thompson, & Davidson, 2003; Comas-Diaz, 2016; Elm, Walls, & Aronson, 2019; Fleischer, 2017; Helms, Nicolas, & Green, 2012; Soto, Baezconde-Garbanati, Schwartz, & Unger, 2015; Walls, Gonzales, Glaney & Onello, 2015). Reducing exposure to chronic stressors such as low socioeconomic status, severe mental health problems, or aggressive behaviors could be effective and preventative (Kelly & Ismail, 2015; Schinckus, Dangoisse, Van den Broucke, & Mikolajczak, 2018, Walders-Abramson et al., 2014). An important aspect of AI/AN

culture is that these groups have experienced historical trauma which may be a significant barrier to T2DM self-management.

In this study, I explored factors of historical trauma and contemporary trauma that may be barriers to T2DM self-management (see Brundisini, Vanstone, Hulan, DeJean, & Giacomini, 2015; Elm, Walls, & Aronson, 2019; Schinckus et al., 2018; Sittner, Greenfield, & Walls, 2018; Walls, Gonzales, Glaney & Onello, 2015; Walls, Whitesell, Barlow, & Sarche, 2017). If AI/AN women manage their blood glucose through proper education and adhere to medicine instruction, diet, exercise, and proper psychological intervention, they could achieve a better quality of life for self, family, and community. In Chapter 1, I give a brief explanation of the background of my study; described the problem statement, and the purpose. I list the research questions and hypotheses, provide a discussion of the theoretical framework, and describe the nature of the study. I briefly explain the operational definitions, assumptions, and scope and delimitations. Finally, I address the limitations and significance of this study.

Background

The prevalence of T2DM among AI/AN peoples is 2.3 times higher than non-Hispanic populations and continues to increase (Cho, 2014; Nicklett, Omidpana, Howard, & Manson, 2016; Walls, Hautala, Gonzalez, Greenfield, (2019); Aronson, B. D., & Onello 2019). Eighty-two percent of newly diagnosed diabetics among AI/ANs are youth aged 10-19 years (Dong, Collado, & Branscum, 2016). T2DM is a complicated disease that requires self-management education and support programs to improve the condition and to alleviate health complications (Powers, 2015; Walls, Whitesell, Barlow, & Sarche,

2017). Researchers have found that AI/ANs need T2DM self-management education that includes caring and culture within the tribe, for the tribe, and by the tribe (Tiedt & Sloan, 2015; Velazquez, Scarton, O'Neal, & Wilkie, 2018). In several studies conducted in AI/AN urban areas, a need for improved self-management of diabetes was found (Chlebowy, Hood, & LaJoie, 2010; Fukunaga, Fukunaga, Uehara, & Tom, 2011; Velazquez, Scarton, O'Neal, & Wilkie, 2018).

T2DM self-management is critical, and healthcare providers should understand the patient's culture and adherence to diet, exercise, blood-glucose testing, foot-care, physical activity, and health-care use that could significantly reduce high blood glucose levels (Micikas, 2015; Rosas et al., 2016; Schmitt, Gahr, Hermanns, Kulzer, Huber, & Haak, 2013; Schubert, C., 2018; Toobert, Hampson, & Glasgow, 2000; Velazquez et al., 2018). AI/AN women need improved T2DM self-management, and healthcare providers need to understand personal and community barriers that impact self-management (Chen, Magliano, & Zimmet, 2012; Gomersall, Madill, & Summers, 2011; Nicklett, Omidpanah, Whitener, Howard, & Manson, 2016; Rosas et al., 2016; Scarton & de Groot, 2016; Schinckus et al., 2018; Schubert, C., 2018; Velazquez et al., 2018). Factors that prevent individuals' ability to self-manage diabetes include cultural values and beliefs, social perceptions of illness within the individual's social context, and reliance on professionals to manage their T2DM (Schubert, 2018; Skewes & Blume, 2019; Velazquez, Scarton, O'Neal, & Wilkie, 2018; Wilkinson et al., 2013). Researchers have shown that individuals with T2DM suffer poor mental health, depression, alcohol dependence, and post-traumatic stress disorder (Inga-Britt & Blomqvist, 2018; Kelly & Ismail, 2015;

Williston et al., 2019). Research also shows that many T2DM patients have experienced chronic stressors, work distress, and many stressful life events resulting in social disparity and low socioeconomic experiences (Elm, Walls, & Aronson, 2019; Schinckus et al., 2018; Gonzales et al., 2018; Kelly & Ismail, 2015; Novak et al., 2013; Warne et al, 2017; Willie, Kemp, Greenfield, & Walls, 2017).

When T2DM self-management is neglected it also significantly increases AI/AN women's complications, increased levels of mortality, morbidity, poor quality of life, and healthcare costs (Brown, Isganaitis, & James-Todd, 2019; Carson, Henderson, King, Kleszynski; Thompson, & Mayer, 2015; O'Connell, Wilson, Manson, & Acton, 2012; Schmitt et al., 2017; Wilkinson et al., 2014). Furthermore, if individuals with T2DM suffer poor mental health, depression, alcohol dependence, or post-traumatic stress disorder, then blood glucose (glycated hemoglobin - HbAlc) may escalate and self-management can be difficult (Kelly & Ismail, 2015; Schinckus, Dangoisse, Van den Broucke, & Mikolajczak, 2018; Schmitt et al., 2017). Cultural perspectives from AI/AN women could significantly contribute to social change and if researchers and healthcare providers understand the impact of historical trauma loss and contemporary trauma experiences on health-related behaviors, patients may be more compliant with a specific culturally-oriented health regimen (Dixon, Salinas, & Marques, 2016; Elm et al., 2019; Fleischer, 2017; Gone & Trimble, 2012; Montag, 2017; Yang, Johnson, D'Eramo-Melkus, & Vorderstrasse, 2018).

Individuals with T2DM are expected to self-manage their diabetes with food, exercise, and medication (see ADA, 2015b; ADA, 2017b; Power et al., 2015; Schinckus

et al., 2018). Healthcare providers should learn and teach culturally-oriented diabetes self-management education to better communicate with patients (Ceriello, 2019; Powers et al., 2015; Schinckus et al., 2018). For instance, diabetic individuals who live in poverty may have difficulty obtaining healthy food (Jiang, 2015; Diabetes Care, 2019; Jones-Smith, 2013). The healthcare provider's responsibility is to be patient-centered and to understand the events that detrimentally affect their patient's lives (see Diabetes Care, 2019; Mead & Bower, 2000). To increase self-management ability among AI/ANs, researchers should advise healthcare providers to be aware of cultural sensitivities and to empower AI/AN women by encouraging them to attend community health programs (see Diabetes Care, 2019; Tucker et al., 2014).

The World Health Organization (Nicklett, Omidpanah, Whitener, Howard, & Manson, 2016; WHO; 2016, 2018) announced in April 2016 that 422 million adults have diabetes worldwide and Harris, Tompkins, and TeHiwi (2016) projected by 2040 there will be 642 million adults with diabetes. Of this global endemic diabetes, 90%-95% individuals have T2DM (Wu, Ding, Tanaka, & Zhang, 2014). In the United States, someone is diagnosed with diabetes every 23 seconds and the estimated 29.1 million diabetics already diagnosed exclude the 86 million prediabetes individuals that are unaware of their condition (CDC, 2014a; CDC, 2019; DiBenedetto et al., 2016). Individuals with blood glucose levels of 5.7% to 6.4% could be made aware of their developing diabetes and adjust lifestyle habits to improve their condition (CDC, 2014a; CDC, 2019; DiBenedetto et al., 2016). Developing a diabetes-oriented lifestyle would improve their condition (CDC, 2014a; CDC, 2019).

In 2016, the CDC reported that AI/ANs were the group most vulnerable to diabetes and the ADA reported in 2017 that 15.9% of AI/ANs had diabetes (ADA, 2017; CDC, 2016). AI/AN women (15.3%) have higher diabetes prevalence than men (14.9%; CDC, 2017a). Booth et al. (2017) reported that in 2014 the CDC found Mexican Pima Indian adults had the highest rate of diabetes in the world with 34.2% for Pima men and 40.8% for Pima women compared to 9.3% in the United States general population. The Maliseet, MicMac, Passamaquoddy, and Penobscot Wabanaki Indian tribes increased diabetes mortality rates from 59.2% in 1990 to 68.3% in 2009 due to T2DM (Martin et al., 2015). Pima Indian women with T2DM almost doubled from 18.9% in 1995 to 36.3% in 2010 (Esparzo-Romero et al., 2015). AI/AN youths aged 15-19 years had a 68% increase in diabetes from 1994-2004 (ADA, 2014).

As noted previously, different types of trauma and stress can negatively impact health and health-related behavior (Elm, 2018; Hartmann & Gone, 2012; Rosas et al., 2016; Tucker et al., 2015; Whitbeck et al., 2004). Of particular relevance for AI/AN cultures is the concept of historical trauma (Brown-Rice, 2013; Heart, 2003; Mohatt, Thompson, Thai, & Tebes, 2014; Salberg & Grand, 2016; Wall et al., 2017). Historical trauma is defined as the intergenerational accumulated emotional and psychological injury or ‘soul wound’ to massive tribal groups that result in contemporary trauma (Brave Heart, 1999a; Brave Heart, Chase, Elkins, & Altschul, 2011; Brown-Rice, 2013; Heart, 2003; Mohatt et al., 2014; Salberg & Grand, 2016; Wall et al., 2017; see Whitbeck et al., 2004). The mental health issues and psychosocial stressors resulting from historical trauma are identified as key factors that have led to the progression of diabetes and have

hampered T2DM self-management among AI/AN adults (Brissette, Whyne, Lehrer, Woo, & Steinhardt, 2020; Hartmann & Gone, 2012; Rosas et al., 2016; Sarche, Tafoya, Croy, & Hill, 2017; Tucker, Wingate, & O'Keefe, 2015; Whitbeck et al., 2004). In addition, other researchers described historical trauma as frequent negative deep thinking or rumination of stressors linked to ethnic cleansing and genocide that has caused mental illness in AI/AN communities (Tucker et al., 2015).

Historical trauma theory clarifies AI/AN's historical losses of land, language, and culture (Brown-Rice, 2013; see Whitbeck et al., 2004) and addresses how this trauma is intergenerationally transmitted and linked to contemporary stressors among Indigenous people (Bombay et al., 2014). Past trauma and current stressors have been shown to contribute to many poor physical and mental health conditions currently experienced by AI/ANs (Bombay et al., 2014). Previous research demonstrated the negative impact of historical trauma and contemporary trauma on the health of AI/AN groups (Brown-Rice, 2013; Elm et al., 2019; Kirmayer, Simpson, & Cargo, 2003). However, previous research has not specifically examined the relationship between historical trauma, contemporary trauma, and T2DM self-management among AI/AN women.

The stressful life events AI/ANs experience include microaggressions defined as events specifically involving discrimination, racism, and daily hassles that target ethnic groups. These microaggressions appear as microassaults, microinsults, and microinvalidations (Elm et al., 2019; Fleischer, 2017; Ong et al., 2013; Ong & Burrow, 2017; Sue, 2007). Many AI/ANs react sensitively to insulting remarks that give rise to high levels of stress, depression, and alcohol abuse that numbs the psychological pain

experienced as part of the contemporary trauma experience (Elm, 2018; Elm et al., 2019; Fleischer, 2017; Jones & Galliher, 2015). The constant impact of daily microaggressions and physiological stressors (poverty, mental health, and aggression) has contributed to the stressful experience that caused T2DM (Elm, 2018; Elm, Walls, & Aronson, 2019; Fleischer, 2017; Kelly & Ismail, 2015).

There are many diverse physical conditions associated with T2DM (Elm et al., 2019; Kahn, Cooper, & Del Prato, 2014). There are also many stress-related factors that contribute to the risk of T2DM and impact the inflammatory, metabolic, cardiovascular, and neuroendocrine regulation (Chrousos, 2009; Elm, 2018; Elm et al., 2019; Fleischer, 2017). Palacios and Portillo (2009) and Elm (2018) emphasized that understanding AI/AN historical legacies in context can help researchers and clinicians enhance optimal health outcomes and life opportunities. Past traumatic responses transmitted to the present population has been shown to determine negative behaviors (Piers, 1996; Pouwer, Schram, Iversen, Nouwen, & Holt, 2020).

Despite extensive research about T2DM self-management, there remains a gap regarding the relationship between historical trauma, contemporary trauma (microaggressions and stressful life events), and self-management of T2DM among AI/AN women. This gap would contribute to the understanding of T2DM self-management and provided researchers and healthcare professionals with information to assist with diabetes complications and psychosocial issues in the lives of AI/AN women (Elm et al., 2019; Fleischer, 2017; Nadeau et al., 2016).

Problem Statement

T2DM worldwide affected 425 million adults in 2017 and will increase to 629 million by 2045 (International Diabetes Federation [IDF]; 2017a). In the USA, there are approximately 30.3 million diabetics (CDC, 2017). Recent statistics showed that almost 16% of AI/ANs suffer from diabetes (ADA, 2017) compared to 9.4% of the general population in the USA (CDC, 2017a; Harris et al., 2016). The IDF (2017) reported there are 199 million women worldwide with diabetes (1 out of 10) with a projected figure of 629 million by 2045 (IDF, 2017; IDF, 2017a). In 2016, Pima Indian women with diabetes were the highest demographic of a group in the world at 40.8% in the USA (Booth et al., 2017; Schulz & Chaudhari, 2015). In 2017, the IDF discussed the need to improve healthcare for women with diabetes and T2DM self-management education (IDF, 2017). Self-management of T2DM is imperative to avoid negative long-term effects (Schmitt et al., 2016). Diabetes among AI/ANs has resulted in endemic T2DM due to poor self-management of the disease for a variety of reasons (Bowen et al., 2016b; Powers et al., 2015).

Although extensive research data was available regarding the prevalence of T2DM among AI/AN people, there remains a problem of the lack of T2DM self-management among AI/AN groups (Wilkinson et al., 2014). There are many barriers to T2DM self-management among AI/AN women and healthcare providers should understand personal and community barriers that affect self-management (Chen, Magliano, & Zimmet, 2012; Gomersall et al., 2011; Nicklett et al., 2016; Rosas et al., 2016; Scarton & de Groot, 2016). To date, researchers have not examined the relationship

between historical trauma, contemporary trauma, and T2DM self-management among AI/AN women. The current study contributes to the literature by specifically examining the relationship between historical trauma and contemporary trauma and T2DM self-management among AI/AN women (Bowen & Murshid, 2016b; Brave Heart & DeBruyn, 1998; Gittelsohn; 2011; Rivkin et al., 2017). Ignoring the need for culturally-oriented T2DM self-management education could result in increased endemic levels and further chronic health complications (Bowen & Murshid, 2016b; Brave Heart & DeBruyn, 1998; Carson et al., 2015; Wilkinson et al., 2014; Rivkin et al., 2017).

Exploring historical trauma, contemporary trauma, and T2DM self-management among AI/AN women could produce culturally-oriented information for research and healthcare organizations to reduce health disparities and mortality rates in Indian populations (Cho et al., 2014; Nicklett et al., 2016). Some AI/AN women have found relief from the psychological issues related to historical and contemporary trauma through culturally oriented therapy (Charbonneau-Dahlen, Lowe, & Morris, 2016). However, Indelicato et al. (2017) found there was still a need for culturally-oriented psychological interventions for diabetes to treat behavioral distress and self-efficacy. The lack of T2DM self-management is also related to poor mental health that subsequently escalates the T2DM condition (Goins, Noonan, Gonzales, Winchester, & Bradley, 2017; Steptoe et al., 2014).

Research showed that AI/ANs who experienced historical trauma also experienced historical loss behavioral symptoms such as depression, substance dependence, suicide, alcoholism, domestic and sexual violence, and dysfunctional

parenting, in addition to the accumulated physical effects of stress that results in chronic diseases such as diabetes (Bombay, Matheson, & Anisman, 2014; Brown-Rice, 2013; Carson et al., 2015; Gobodo-Madikizela, 2016; Jacob et al., 2013; Kirmayer, Gone, & Moses, 2014; Pouwer et al., 2020; Whitbeck et al., 2004). Historical trauma affects health when transmitted continuously to current generations (MacDonald & Steenbeek, 2015; Mohatt et al., 2014). Thus, historical trauma and the cumulative emotional and psychological effects through generations has resulted in contemporary trauma (Brave Heart, 2003; Mohatt et al., 2014; Salberg & Grand, 2016).

Some losses or atrocities women have experienced historically included being shocked, burned, starved, exposed, stripped, raped, and sexually molested by United States military members (Butler, 2016). Illegal sterilizations were also performed by Indian Health Services (IHS) that reduced births from 3.19 to 1.30 during 1980 (Torpy, 2016). Historical trauma leaves a trail of contemporary trauma consisting of stressful life events (Mohatt et al., 2014; Salberg & Grand, 2016). Stressful life events predicted by historical trauma are often incidents where family members or close relatives are murdered, treated violently, involved in motor vehicle accidents, take their own lives, smoke, are discriminated against, and experience many other forms of mortality (Beasely, Thompson, & Davidson, 2003; Soto, Baezconde-Garbanati, Schwartz, & Unger, 2015).

Stressful life events continue as AI/AN women with T2DM perpetuate T2DM in utero (referred to as MODY or monogenic diabetes) if T2DM is mismanaged (National Institute of Diabetes & Digestive & Kidney Diseases [NIDDKD], 2014; Raglan, 2016). Many preterm birth complications such as cerebral palsy (Sukhov, Wu, Xing, Smith, &

Gilbert, 2012), learning disabilities (Moster, Lie, & Makestad, 2008), or respiratory illnesses (Hibbard, Clark, Ellersieck, Meihls, El Khishen, Kaster, ... & Kurtz, 2010) result in stressful life events that occurred because of the lack of T2DM self-management. Disproportionate preterm births among AI/AN women were associated with psychosocial, sociodemographic, and medical barriers (Quandt et al., 2016; Raglan et al., 2016).

Many stressful life events result from subtle discriminations, racism, and irritations of microassault, microinsult, and microinvalidation that affect the sensitivities and mental health of AI/ANs (Jones & Galliher, 2015; Riel, 2019; Sue, 2007). By understanding historical legacies of AI/AN women in context of historical and contemporary trauma, researchers and healthcare providers may be able to enhance optimal health outcomes and life opportunities for AI/AN women with diabetes (Palacios & Portillo, 2009).

Purpose

The purpose of this quantitative study was to examine the relationship between historical trauma, contemporary trauma, and T2DM self-management among AI/AN women. Historical trauma defined as historical losses of land, language, and culture include historical loss associated symptoms of anxiety/depression and anger/avoidance (Whitbeck et al., 2004). Contemporary trauma referred to stressful life events and included microaggressions described as discrimination, racism, and oppression experienced by AI/ANs (Braveheart & DeBruyns, 1998). T2DM self-management requires self-care activities and regimen adherence for blood glucose control related to

diabetes (Schmitt et al., 2013). The results of my study may provide insights into the relationship between historical and contemporary trauma and T2DM self-management among AI/AN women living in Southwestern United States.

Research Questions and Hypotheses

The purpose of this study was to discover whether there was a relationship between historical trauma, contemporary trauma and self-management of T2DM among AI/AN women. To that end, I explored the following four research questions:

Research Question 1: To what extent does historical loss, as measured by the Historical Loss Scale (HLS) total score, relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, healthcare-use subscale scores, and total self-management score)?

$H_0$1: Historical loss is not a significant predictor of T2DM self-management.

H_a1: Historical loss is a significant predictor of T2DM self-management.

Research Question 2: To what extent do historical loss associated symptoms, as measured by the Historical Loss Associated Symptoms Scale (HLASS; (anxiety/depression and anger/avoidance subscale scores, and total score), relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

$H_0$2:– Historical loss associated symptoms are not significant predictors of T2DM self-management.

H_a2: Historical loss associated symptoms are significant predictors of T2DM self-management.

Research Question 3: To what extent do stressful life events, as measured by the Stressful Life Events Screening Questionnaire (SLESQ) total score, relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

H_03: Stressful life events are not a significant predictor of T2DM self-management.

H_a3: Stressful life events are a significant predictor of T2DM self-management.

Research Question 4: To what extent do microaggressions, as measured by the Daily Racial Microaggressions Scale (DRMS; microinsults and microinvalidations subscale scores, and total microaggression score), relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

H_04: Microaggressions are not a significant predictor of T2DM self-management.

H_a4: Microaggressions are a significant predictor of T2DM self-management.

Theoretical Framework

The theoretical framework for this study was Braveheart and DeBruyn's (1998) theory of historical trauma that incorporates contemporary stressful life events and microaggressions experienced by AI/ANs. Historical trauma is thoughts of loss of

population, land, and culture, and involves feelings associated with anxiety/depression and anger/avoidance (Braveheart & DeBruyn, 1998). Many authors have theorized about various forms of historical traumas including the Holocaust, genocides, internment, and apartheid. However, the concept of historical trauma in this theory is associated with AI/AN suffering and atrocities against them during and after colonization of the American continent (Andermahr, 2015; Brave Heart & DeBruyn, 1998; Evans-Campbell, 2008; Kellermann, 2001; Prager, 2016; Prussing, 2014). Although a recently developed term and theory, historical trauma is a work in progress to describe the distinct AI/AN experience (Evans-Campbell, 2008; Prussing, 2014; Walls & Whitbeck, 2012).

Contemporary trauma is a consequence of historical trauma and includes stressful life events (Beasely, Thompson, & Davidson, 2003; Goodman et al., 1998; Soto et al., 2015) and microaggressions made up of microinsults and microinvalidations (Jones & Galliher, 2015; Riel, 2019). The high levels of stressful life events that have prevailed in AI/AN society include accidents, homicides, and suicides among relatives and friends in addition to violence, economic hardships, smoking, substance abuse, depression, engaging in risky behaviors, and being discriminated against (Alcántara & Gone, 2007; Beasely, Thompson, & Davidson, 2003; Brave Heart & DeBruyn, 1998; Burrage, Gagnon, & Graham-Bermann, 2018; Soto et al., 2015). Historical trauma theory also encompasses microaggressions broken down into microassaults, microinsults, and microinvalidations. Microaggressions are defined as daily events of discrimination, racism, and hassles of ethnic groups added to stressors already experienced (Bryant-

Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Jones & Galliher, 2015; Sue et al., 2007).

AI/ANs have experienced colonization outcomes of genocide, ethnocide, loss of homelands, language, forced displacement, and forced assimilation (Walls et al., 2017). Historical trauma theory encapsulates the social and political forces inflicted on AI/ANs and describes the intergenerational transmission effects (Heart, 1998). The high levels of mental illness among AI/ANs require a historical trauma framework for researchers and healthcare providers to better understand the AI/AN cultural background and applicable interventions (Braveheart & DeBruyn, 1998; Evans-Campbell, 2008; Prussing, 2014). Historical trauma theory provides an education of the issues and ramifications of grief caused by colonization on AI/AN cultures (Braveheart & DeBruyn, 1998).

Historical trauma theory was the basis of this study to find if there was a relationship between historical trauma, contemporary trauma, and T2DM self-management among AI/AN women (see Beasely, Thompson, & Davidson, 2003; Brave Heart & DeBruyn, 1998; Jones & Galliher, 2015; Sue et al., 2007). Historical trauma theory stipulates the perceptions of historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance), microinsults and microinvalidations, and stressful life events (Braveheart & DeBruyn, 1998; Schmitt et al., 2013). Historical trauma theory allows for a closer identification of contemporary trauma that presents endemics experienced in tribal groups that resulted from colonization (Braveheart & DeBruyn, 1998; Schmitt et al., 2013). Understanding historical trauma theory helped me clearly outline aspects of intergenerational accumulated emotional and psychological

injury or ‘soul wound’ experienced en mass and gain further insight of the development of contemporary traumas (Brave Heart & DeBruyn, 1998; Brave Heart et al., 2011; Brown-Rice, 2013; Heart, 2003; Mohatt et al., 2014; Salberg & Grand, 2016; Walls et al., 2017; Whitbeck et al., 2004). Historical trauma theory includes a description of why AI/ANs have frequent negative deep thoughts or ruminations of stressors linked to ethnic cleansing and genocide that contributed to mental and physical disparities that included endemic T2DM, which is highly prevalent in AI/AN communities (Tucker, Wingate, & O’Keefe, 2015).

Nature of the Study

In this study, I employed a quantitative research method and used a nonexperimental correlational design. The cross-sectional design examined the relationship between several variables at a single point in time commonly used in research (Field, 2013; Frankfort-Nachmias, & Nachmias, 2012). Specifically, I examined the relationships between historical trauma, contemporary trauma, and T2DM self-management among AI/AN women at a single point in time. Quantitative analysis was suitable because I collected data from AI/AN women with T2DM who were registered in health centers in Southwestern United States using five measuring instruments. The measuring instruments I used to collect data consisted of the HLS, the HLASS, the DRMS, and the SLESQ.

I used multiple regression to assess a linear combination of eight predictor variables (Field, 2013). The eight-predictor variables included: historical loss, historical loss associated symptoms (anxiety/depression, anger/avoidance, and total score), stressful

life events (total score), and microaggressions (microinsults, microinvalidations, and total score). The criterion variable of T2DM self-management included: glucose management, dietary control, physical activity, health-care use subscales and total score among AI/AN women. As cross-sectional designs are methodologically limited, multiple regression was appropriate for this study to obtain a pattern of relationships between variables (see Frank-Nachmias & Nachmias, 2008).

Operational Definitions

American Indian/Alaska Native: An AI/AN is an indigenous individual in the continental United States (Sue & Sue, 2001). An indigenous person may be federally defined by blood quantum or tribal enrollment (Sue & Sue, 2001). However, tribal groups are at liberty to set blood quantum criteria as an enrollment requirement. There are over 567 federally recognized tribal nations (Census.gov, 2016). In 2015, AI/ANs constituted 1.5% of the United States population and the projected AI/AN population in 2060 is 10.2 million (2.4%; Census Gov., 2015).

Contemporary Trauma: Contemporary trauma is part of the historical trauma framework and included stressful life events (Beasely, Thompson, & Davidson, 2003; Soto et al., 2015). It also included microaggressions, or more specifically, microinsults, microassaults, and microinvalidations (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Sue et al., 2007).

Diabetes Self-Management: Diabetes self-management reduced complications and mortality in type-2 diabetic patients, and was the knowledge, skills, and abilities required for a patient to manage his or her condition. Self-management ensured adequate nutrition,

regular physical activity, appropriate medication use, feet care, regularly monitoring blood glucose levels, and maintained a healthy lifestyle (Mehravar et al., 2016).

Historical Loss Associated Symptoms: The traditional losses experienced by AI/AN people after colonization are the frequent deep thoughts of stressors connected to ethnic cleansing and genocide that cause mental illness which is very prevalent in AI/AN communities (Tucker, Wingate, & O'Keefe, 2015).

Historical Loss: The loss of land, language, and culture are the traumas experienced by the AI/AN Tribal groups (Whitbeck et al., 2004). The feelings of loss are the intergenerational chronic trauma experienced among American Indian people (Brave Heart & DeBruyn, 1998).

Historical Trauma Framework: The historical trauma framework included intergenerational accumulated emotional and psychological injury or 'soul wound' to massive Tribal groups that resulted in contemporary trauma or stressful life events and microaggressions experienced by AI/ANs (Brave Heart & DeBruyn, 1998; Brave Heart et al., 2011; Brown-Rice, 2013; Heart, 2003; Mohatt et al., 2014; Salberg & Grand, 2016; Walls et al., 2017; see Whitbeck et al., 2004). The historical events have a destructive tendency at a physical and/or emotional level of many AI/ANs in many communities (Brave Heart, 1999b, 2000; Brave Heart & DeBruyn, 1998).

Microaggressions: Microaggressions are contemporary racism, ethnic apprehension, and prejudice, that included microinsults, microassaults, and microinvalidations against minority ethnic groups by the majority (Bryant-Davis, 2018;

Comas-Diaz, 2016; Fleischer, 2017; Helms, Nicolas, & Green, 2012; see Sue et al., 2007).

Microassaults: Microassaults are explicit racial derogations (verbal or nonverbal criticisms) to hurt the intended injured party by using name-calling, avoidant behavior, or purposeful discriminatory actions (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Sue et al., 2007). Using words such as “colored,” racial epithets, not mixing interracially, that intentionally served a White patron before ethnic minority groups or someone of color (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; see Sue et al., 2007). Microassaults are conscious "old fashioned" racisms from one person to another and expressed in limited "private" situations (micro) that allowed the attacker anonymity (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; see Sue et al., 2007).

Microinsults: The devious insults and impulsive understatements inappropriate to the targeted Native individual are defined as microinsults (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Lukianoff & Haidt, 2015; Pierce, Carew, Pierce-Gonzalez, & Willis, 1978).

Microinvalidations: Microinvalidations are invalidations of intra-ethnic differences that emphasize homogeneity of ethnic groups and ignored intra-ethnic differences (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; see Sue et al., 2007). Also, microinvalidations are thoughts that all members of an ethnic minority group speak the same language, values, or culture (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; see Sue et al., 2007).

Soul Wound: This term is the intergenerational accumulated emotional and psychological injury to a cultural group en masse that described the wound that resulted from historical trauma, the ungrieved losses, the internalized oppression, pain, and learned helplessness that emanates from that wound (Duran & Duran, 1995; Duran & Ivey, 2007).

Stressful Life Events: Stressful life events are instigated by historical trauma. The events are described as a lack of ethics, demoralization, substance abuse, and suicide that are extreme in nature with traumatic consequences (Gone, 2014), and when these events occurred it required unexpected change in the individual's life (Dohrenwend, 2006).

Tribe or Nation: A tribe or nation referred to North American individuals that are part of a common ancestry, language, and culture. They are Indigenous groups and represented the 573 federally acknowledged tribes that speak more than 300 languages (Census.gov, 2018).

Type-2 Diabetes: T2DM is a metabolic disorder that distinctively features chronically elevated blood glucose and high risks of developing diabetes complications (Gomersall et al., 2011).

Assumptions

In this study, I assumed that participants registered at AI/AN health centers in Southwestern United States were patients diagnosed with T2DM symptoms according to the American Diabetes Association (ADA, 2015). In addition, I assumed records of the AI/AN health centers are updated and accurately portray T2DM diagnoses of participants. I also assumed that participants completed the questionnaires honestly and

as accurately as possible. Another assumption was that the questionnaires, DSMQ, HLS, HLASS, DRMS, and SLEQ, are reliable and valid measurement tools.

Scope and Delimitations

The scope of this study consisted of historical trauma (historical loss and symptoms), contemporary trauma (stressful life events, microinsults, microinvalidations), and T2DM self-management using the historical trauma theory. Historical trauma theory formed the basis of my study because it expounds on historical trauma and contemporary trauma experienced by AI/AN women. The historical trauma theory specifically takes into account historical loss of land, language, culture, and the intergenerational effects. The theory closely linked historical loss and the feelings and emotional symptoms of anxiety/depression and anger/avoidance experienced by AI/AN women.

In this quantitative research design the main goal was to make generalizations from the sample (AI/AN women with T2DM) to populations (all AI/AN Tribal women and indigenous groups worldwide with T2DM; Cook & Campbell, 1979; World Health Organization, 2016, 2018; Wu, Ding, Tanaka, & Zhang, 2014). My study focused on AI/AN women diagnosed with T2DM for at least 1 year, who were aged 18 years or older, registered at AI/AN health centers (a convenience sample that slightly compromised selection bias) in the geographical area of Southwestern United States. This population was considered because AI/AN women with diabetes are more vulnerable to diabetes complications and if not self-managed properly, diabetes can affect offspring in utero and endemic T2DM would exponentially increase.

Limitations

It became apparent in the literature reviewed that the proximity to reservations encouraged AI/ANs (particularly adolescents) to be more traditional than AI/ANs living further away, and that distinction may affect responses to questions (Armenta, Whitbeck, & Habecker, 2016). For example, research found that the more encultured the AI/AN, the more perceptions of discrimination were experienced (Tucker, Wingate, & O'Keefe, 2015). Self-management of T2DM might be influenced by familial, social, political, economic, and institutional power (Holt et al., 2016; Nicklett & Damiano, 2014). Therefore, there might be other variables that accounts for some of the variance in predicting T2DM self-management. Although participants were mentally and physically capable of completing the five questionnaires, the smallest amount of stress may affect their responses. Participants may have discussed the questionnaires with other participants or family members that may result in inaccurate or fabricated responses. Nachmias, 2008).

Significance

The importance of this study was to find the relationship between historical trauma and contemporary trauma that predicted an impact on self-management of T2DM among AI/AN women. There is no T2DM self-management research pertaining to AI/AN women relative to historical trauma and contemporary trauma. The barriers that prevent T2DM self-management pertinent to historical loss perceptions, stressful life events, and daily microaggressions commonly experienced by AI/AN women could decrease

negative health effects and high healthcare costs related to T2DM and associated complications.

The results of the research could be used for culturally appropriate interventions for AI/ANs from a women's perspective. There was also a need expressed by researchers for culturally orientated psychological interventions among AI/ANs (Indelicato et al., 2017; Schubert, C., 2018). Determining the relationship of historical trauma, contemporary trauma, and T2DM self-management among AI/AN women may provide information for healthcare providers, researchers, and educators to develop appropriate treatments and education. The results of this research study could be used in many environments including the social justice system to promote well-being and build resilience for those experiencing intergenerational trauma indirectly and directly (see Gone, 2009; Ramirez-Barat & Schulze, 2018).

Summary

In Chapter 1, I reviewed the purpose of the study to determine the AI/AN women with T2DM and their perspectives of loss of land, language, and culture, that included stressful life events, microinsults, and microinvalidations that predicted AI/AN women's health outcomes. In addition, I discussed the background, problem statement, and the purpose of the study. Previous research has not examined the impact that historical and contemporary trauma might have on the self-management of T2DM among AI/AN women. In Chapter 1, I also discussed historical trauma theory and the nature of the study. Included in this chapter was a discussion of the significance and limitations of this study.

In Chapter 2, I will discuss the current literature pertinent to T2DM, historical trauma, and contemporary trauma and how they connect to AI/ANs. Furthermore, I will discuss AI/ANs in general and women's past experiences of historical trauma and the effect it has had in contemporary times. I also include details about historical loss and the psychological and physical harm created through generations to the present time that results in contemporary trauma that could affect T2DM self-management.

Chapter 2: Literature Review

In Chapter 2, I present a review of literature regarding the relationship between self-management of T2DM, historical trauma, and contemporary trauma among AI/AN women based on historical trauma theory. Despite extensive research exploring T2DM among AI/ANs, no particular attention has been paid to the impact that historical and contemporary trauma may have on self-management of T2DM among AI/AN women.

The worldwide endemic T2DM has risen to 422 million adults (WHO, 2016b, 2018). The CDC (2016) reported there are more than 29.1 million US adults that have diabetes. The CDC (2017a) further reported national diabetes statistics increased in one year to 30.3 million people that have diabetes (9.4%). However, 86 million US adults have prediabetes, and 90% of these individuals are unaware that they have prediabetes. There are approximately 6.6 million (2%) AI/ANs in the United States (CDC, 2017c; Census Bureau, 2016). In 2014, the CDC (2016) reported 17.6% of the AI/AN population (18 years and older) had T2DM compared to 7.3% non-Hispanic White population. AI/AN adults were diagnosed with diabetes 2.3 times more than White adults in 2012, and in 2016, diagnoses increased 2.4 times (CDC, 2016). The above statistics raise questions about the T2DM epidemic among AI/AN groups and emphasize a need to examine relationships that may impact self-management of T2DM.

In this study, I examined possible relationships that exist between T2DM self-management, historical trauma, and contemporary trauma. Previous research regarding self-management of T2DM had not been performed regarding historical and contemporary trauma, specifically among AI/AN women. In this chapter, I describe the

literature search strategy and the historical trauma theory framework associated with the variables in my study. Further, based on literature reviewed, I provided relevant information to support historical trauma as experienced by AI/ANs in general and specifically women. In addition, the literature reviewed describes contemporary trauma that resulted from historical trauma including microaggressions and stressful life events. Finally, I review articles on other factors that contribute to T2DM, self-management of T2DM, and self-management barriers.

Literature Search Strategy

In conducting the review of the literature, I utilized Walden University Library's databases including: EBSCOhost, ERIC, PsycARTICLES, PsycBOOKS, PsycEXTRA, PsycINFO, SAGE Full-Text, and SOCIndex. Various government and private organization websites were explored including Indian Health Services (IHS), the National Institute of Health (NIH), and American Diabetes Association for AI/ANs. Other organizations and websites included, but were not limited to, the American Psychological Association (APA), International Diabetes Federation (IDF), World Journal of Diabetes, the CDC, the Diabetes Prevention Research Group, the National Diabetes Education Program, The Lancet Diabetes and Endocrinology journal, The Lancet Psychiatry journal, Diabetes Care Journals online, Libertas Academic, scientific, technical, and medical journals.

The following keywords and phrases were initially used: *historical trauma, AI/ANs, Native American, historical grief, ethnic identity, microaggressions, type-2 diabetes, diabetes care, self-management, self-care behavior, metabolic control, HbAlc,*

hyperglycemia, measurement, assessments, psychometric instruments, stressful life events, stress, psychological health, cognitive hardiness, AI/AN women, Native American women with T2DM, contemporary trauma, historical loss, AI/AN stressors, urban AI/ANs, Aboriginal, Indigenous groups, AI/AN mental care, AI/AN healthcare, and *AI/AN T2DM*. More than 80% of the cited works are from peer-reviewed journals. The focus of the literature review was from 2005 to 2020. The remaining 20% of the cited works were found in secondary sources and organization reports. Included in the search were terms such as *the AI/AN Removal Act (1830),* and *the Dawes Act (1886)* dating back to the 1800s for information related to theoretical perspectives of AI/ANs, historical trauma, contemporary trauma, and other associated variables in the study.

Theoretical Framework

In this theoretical review, I focused on Braveheart and DeBruyn's (1998) historical trauma theory to clarify factors of historical loss that incorporated stressful life events and microaggressions as part of contemporary trauma, which are prevalent among AI/ANs. Braveheart and DeBruyn's (1998) historical trauma framework is comprised of (a) perceived historical loss pertaining to loss of population, land, and culture; (b) historical loss associated symptoms of anxiety/depression and anger/avoidance; including contemporary trauma, and (c) stressful life events (Goodman et al., 1998) and microaggressions (microinsults and microinvalidations; Jones & Galliher, 2015).

Historical Trauma Theory Framework

The historical trauma concept was developed in 1995 regarding the unresolved grief, psychological trauma, or soul wound suffered by AI/ANs (Heart, 1998). A number

of other groups have experienced similar types of historical trauma. For example, Jewish Holocaust survivors during WWII (1939-1945) experienced intergenerational psychological trauma (Andermahr, 2015; Danieli, Norris, & Engdahl, 2016; Kellermann, 2001). At the same time, the Japanese American interment in the USA took place during WWII (Evans-Campbell, 2008). Previously, from 1915 to 1923 genocide was committed against Armenians by the Ottomans (Turks; Evans-Campbell, 2008). More recently, Prager (2016) compared the South African apartheid system to Holocaust survivors that experienced ongoing trauma. Prussing (2014) conducted a meta-analysis of 30 historical trauma articles that provided clarity of historical trauma within an evidence-based, culturally relevant, and decolonizing approach. Historical trauma theory differs from theory about the Jewish Holocaust, genocide, internment, and apartheid, because the concept of historical trauma in this theory is associated specifically with the suffering of AI/ANs during colonization that continues to this day (Heart, 1998). AI/AN authors and researchers claim that historical trauma is an authentic description of the AI/AN's unique experience with a few exceptions (Evans-Campbell, 2008; Gone et al., 2019; Prussing, 2014; Walls & Whitbeck, 2012).

The historical trauma concept specifically covers the negative social and political incidents of the AI/ANs that are transmitted to current generations. A broader concept of historical trauma was needed for North American tribal groups associated with colonization (Hartmann & Gone, 2012; Skewes & Blume, 2019). AI/ANs have withstood the effects of colonization such as genocide, ethnocide, loss of homelands, language, forced displacement, and forced assimilation (Gone et al., 2019; Walls et al., 2017;

Zalcman, 2016). Consequently, the historical trauma concept represents the social and political forces imposed on AI/ANs and precisely portrays the intergenerational transmission and its effects (Heart, 1998; Zalcman, 2016).

Holt et al. (2016) found the negative social and political issues required psychological care training for recognition and assessment of the historical trauma concepts. Historical trauma theory represents concepts for the opportunity to address social and political issues (Hartmann & Gone, 2014; Heart, 1998; Prussing, 2014; Walls et al., 2017). The concepts of historical trauma theory are necessary to treat the high levels of mental illness among AI/ANs (Evans-Campbell, 2008; Prussing, 2014). In addition, Skewes and Blume (2019) found key informants stipulated poor health was connected to historical trauma as microaggressions and institutionalized racism.

Brave Heart and DeBruyn (1998) elaborated on historical trauma theory while working as a Lakota clinical social worker with a French Canadian medical anthropologist (DeBruyn) from 1970 to 1988. The final historical trauma framework provided cultural clarity and understanding of AI/ANs for researchers and educators (Braveheart & DeBruyn, 1998). Historical trauma theory permits the possibility of education and knowledge of the impact associated with the AI/AN grief experience (Braveheart & DeBruyn, 1998; Ramirez-Barat & Schulze, 2018). For instance, by sharing the knowledge of historical trauma, the affects with other Lakota in a traditional context provided grief relief (Braveheart & DeBruyn, 1998).

In the process, grief is decreased to encourage cultural identity and encourage the individual and community to restore their health (Duran, 2006; Heart, 1998). The

researcher's personal input of the AI/AN experience of historical trauma provided a basis for cultural clarity and understanding (Heart, 1998). It also allowed for education and knowledge to be expressed and shared with other AI/AN Tribal groups to relieve trauma and develop conceptions of cultural identity and health restoration (Prussing, 2014). Skewes and Blume (2018) and Comas-Diaz et al. (2016, 2019) reported racial trauma must be considered in interventions to reduce health disparities among AI/ANs. However, by understanding the relationship between racial trauma, family, community, ethnicity, socioeconomic status, and physical health was vital to inform medical and behavioral interventions especially for vulnerable populations (Klest, Freyd, Hampson, & Dubanoski, 2013; Skewes & Blume, 2018). Successful intervention programs will need to improve social, economic, and equal health systems that drove the cycles of victimization and revictimization that continues in AI/AN society (Skewes & Blume, 2018).

Historical trauma theory established information to understand the loss of land, language, and culture (Skewes & Blume, 2018; Walls et al., 2017; see Whitbeck et al., 2004). Broadly stated the definition of historical trauma is an intergenerational collection of psychological injuries to a large group that resulted in contemporary trauma (Brave Heart & DeBruyn, 1998; Brave Heart et al., 2011; Brown-Rice, 2013; Heart, 2003; Mohatt et al., 2014; Salberg & Grand, 2016; Walls et al., 2017; see Whitbeck et al., 2004). These descriptions of historical trauma are accepted by AI/AN healers and appropriate for researchers, educators, and healthcare providers to understand the AI/AN's historical experience (Brave Heart et al., 2011; Brown-Rice, 2013; Duran, 2006;

Ehlers et al., 2013; Goodkind et al., 2015; Myhra, 2011). The AI/AN en masse suffers historical trauma and losses that are associated with symptoms of anxiety/depression and anger/avoidance (Brave Heart & DeBruyn, 1998; Walls et al., 2017).

Historical loss associated symptoms illustrates historical trauma as frequent ruminations of stressors linked to ethnic cleansing and genocide that cause mental illness prevalent in AI/AN communities (Duran, 2006; Tucker, Wingate, & O'Keefe, 2015). Researchers and clinicians found comprehending historical legacies of AI/AN women in their current context aided in optimal health outcomes and life opportunities (Palacios & Portillo, 2009). Further, nurses were found to diagnose for physical and psychosocial signs of trauma but did not specifically understand historical trauma occurrence that required training for prevention, education, and healthcare delivery (Heckert & Eisenhauer, 2014). Cromer et al. (2018) found that institutional betrayal trauma theory could be the center of historical loss and could clarify perceptions.

Gone and Trimble (2012) found AI/AN mental health issues surged due to reasons such as ethnic identity, lack of mental health systems, and other healthcare problems. Other authors found AI/AN women experience mental problems that affected their choices in life (Farley et al., 2016; Joe & Gachupin, 2016). Generally, women are disproportionately represented in mental health services due to specific gender issues that could be a significant barrier among AI/AN women and T2DM self-management (Tseris, 2018). Brockie et al. (2015) found a total of 288 Native Americans (15-24 years of age) that experienced adverse childhood experiences (ACE) 78% reported at least one ACE, 40% at least two, and the majority were females (51%). Many researchers found AI/ANs

are reluctant to use available mental health treatment because it was not sufficiently culturally-oriented (Dickerson, Brown, Johnson, Schweigman, & D'Amico, 2016; Hartmann & Gone, 2012; Kropp et al., 2014; Mamun et al., 2007; Moghaddam, Momper, & Fong, 2015). Researchers' measures should be based on scientific and cultural strategies to address AI/AN health issues (Walls et al., 2017a).

Historical Trauma and AI/AN Women

In this section, research studies described AI/AN women and their ancestors who experienced many atrocities that affected their roles as life givers and cultural teachers in family and community (Hill & Hoss, 2018; Linklater, 2014). Government training manuals confirmed the U.S. Army School of Americas at Fort Benning, Georgia used extortion, blackmail, beatings, and executions to eliminate the AI/ANs (Butler, 2016). Women were shocked, burned, starved, exposed, stripped, raped, and sexually molested by USA trained military and paramilitary members (Butler, 2016). Also, during the 1960s to 1970s in four out of twelve Indian Health Services (IHS) regions IHS doctors performed illegal sterilizations on AI/AN women that significantly reduced children per woman from 3.19 to 1.30 in 1980 (Torpy, 2016). Consequently, these historical losses created stressful life events that included low self-esteem and mental illness that interfere with parenting and cultural education (Kirmayer et al., 2014). The transmissions of historical atrocities were deliberately transmitted from generation to generation that resulted in high mortality rates (Danieli, Norris, & Engdahl, 2016; Heart, 1999). Health issues followed such as heart disease, hypertension, alcohol abuse, and suicidal behavior (Heart, 1999).

European law and colonization legally forced a change to the AI/AN culture and the responsibilities of women (Cromer et al., 2018; Grande, 2015). In the past, AI/AN husbands and fathers acknowledged AI/AN women and children as sacred and because of the forced change in tradition AI/AN women today suffer the worst violence and interpersonal trauma of all ethnic groups in the USA (Beals et al., 2013; Breiding et al., 2014; Burnette, 2015; Yuan et al., 2015). Violence was modestly associated with the risk of T2DM and severe violence significantly increased the risk of T2DM (Mason et al., 2013).

Originally, the AI/AN women were the central figures in their families. This empowered the AI/AN woman and she created and encouraged family connectedness (Walters & Simoni, 2002). The AI/AN woman's traditional role consisted of sacred life giver, teacher, socializer of children, healer, doctor, seer, and warrior that centrally positioned her in family and society (Walters & Simoni, 2002). The AI/AN woman's role diminished significantly and was replaced with contemporary trauma comprised of sexual abuse, rape, psychological assaults, ritual abuse, accidents, environmental disasters, wars, and holocausts (Linklater, 2014). Linklater (2014) elaborated on the AI/AN trauma experience as ethno-stress that drastically alters and destroys a person's cultural thoughts and emotions.

By removing the AI/AN woman's responsibilities socially and politically during colonization the core of the culture disintegrated (Walter & Simoni, 2002). Historically, women shared equal rights and power with men in their tribal groups (Joe & Gachupin, 2014). Thus, over time, the right of AI/AN women to teach cultural ways was lost and

future generations were left with an identity crisis (Grande, 2015). Lobo, Talbot, and Carlston (2016) found that AI/AN women were treated subserviently and sexually exploited because of enforced acculturation and post-colonial neglect. AI/AN women were robbed of their right to be indigenous and the opportunity to teach culture to future generations (Grande, 2015; Skewes & Blume, 2018).

Before colonization, AI/AN polygamous marriage were common, without sexual relationships, and were accepted as equal among some AI/AN tribes especially when the wife was widowed or a single sister needed a home (Grande, 2015; Heart, 1999). After colonization, the AI/AN women were given a surname to indicate her husband owned her (Heart et al., 2016). The "rule of thumb" was applied to AI/AN relationships after colonization from English law of striking a wife with a "board no thicker than the width of his thumb" (Heart et al., 2016; U.S. Commission on Civil Rights, 1982). The Federal government ignored the AI/AN women as leaders when negotiating with tribes during colonization (Heart et al., 2016).

However, AI/AN women such as Tacumwah, a Mohican woman, regained tribal leadership in their communities (University of Nebraska-Lincoln [UNL], 2014). The voice of the women became stronger as they learned to regain leadership through education as the former principal chief of the Cherokee Nation, Wilma Mankiller, and president of the Oglala Sioux tribe, Theresa Two Bulls experienced (UNL, 2014).

Contemporary Trauma

Contemporary trauma is part of the historical trauma framework and included stressful life events (Beasely, Thompson, & Davidson, 2003; Soto et al., 2015).

Laplanche and Pontalis (1973) defined trauma as a real event experienced by a person exposed to physical and/or psychological inducement beyond their resistance. The impact of trauma depends on the developmental level and the physical and mental condition of a victim (Laplanche & Pontalis, 1973). Each individual, family, and tribal community experience stressful life events differently (Bowen & Murshid, 2016b; Brave Heart & DeBruyn, 1998; Rivkin et al., 2017). The individuals' personality predicts health impacts, for instance, some individuals who experienced high stress became ill (Kobasa, 1979). Those who experienced high stress and did not become ill were hardy, strongly committed to self, vigorously responded to the environment, had a sense of meaningfulness, and an internal locus of control (Kobasa, 1979). Many theories of stress related illness suggested that both acute and chronic stress over time cause illness (Schneiderman, Ironson, & Siegel, 2005).

Researchers found that without family, community, and cultural connectedness in a supportive network context, resilience against stressful life events was difficult (Oré, Teufel-Shone, & Chico-Jarella, 2016). Martin and Yurkovich (2014) found AI/ANs perceive family as close-knit. Lucero (2014) found that cultural connectedness was social interactions with Native peoples actively involved in knowledge and understanding of their culture. Contrary to what AI/ANs described as close-knit families, high levels of stressful life events prevail in AI/AN society such as accidents, homicide, and suicide (Brave Heart & DeBruyn, 1998). However, Mészáros (2010) emphasized the importance of the absence of a loved or trusted person during or after a traumatic experience determined the degree of psychological impact on the victim.

Stressful Life Events

Contemporary trauma is ongoing as stressful life events that obscure reality and relief is only possible through cultural intervention (Kelley et al., 2018; Prager, 2016). Many AI/AN women expressed gratitude for the relief from residential boarding school atrocities by participating in culturally-oriented storytelling methods to alleviate contemporary trauma effects (Charbonneau-Dahlen, Cowan, 2020; Lowe, & Morris, 2016). Researchers described contemporary trauma as the loss of relatives and/or friends due to accidents, homicides, suicide, and violence, as well as their experience with economic hardships, smoking, substance abuse, depression, risky behaviors, and discriminations that envelope the lives of AI/ANs (Beasely et al., 2003; Hartmann et al., 2018; Soto et al., 2015). Some stressful life events initiated by the effects of colonization are the lack of ethics, demoralization, substance abuse, and suicide that are extreme in nature with traumatic consequences (Gone, 2014; Hartmann et al., 2019; McQuaid et al., 2017; Zalcman, 2016). Presently, the AI/AN mental health system acknowledges stressful life events as a colonization causal factor for the many disparities experienced (Gone, 2013; Hartmann et al., 2018; Zalcman, 2016). Some AI/AN youth experienced high levels of stress surrounded by stressful life events (Gone, 2013; Hartmann et al., 2018). They managed their stress by connecting with important others, being involved in positive activities, and having positive attitudes (Kelley & Lowe, 2012; Hartmann et al., 2018).

AI/AN children experience historical trauma vicariously in childhood as parents transmitted atrocities to them that cause long-term stressful events (Heart, 1998;

Hartmann et al., 2018; Prager, 2016; Soto et al., 2015). In short, stressful life events significantly impacted individuals, families, and communities in contexts of violence, economic hardship, and discrimination (Brockie et al., 2015; Gonzales et al., 2016). Traditionally, AI/ANs referred to trauma as death, tribal wars, starvation, and separation from family (Prager, 2016). However, since colonization, stressful life events relate to systematic oppression, violence, and abuse that are unknowingly transmitted intergenerationally and impact new generations (Hartmann et al., 2018; Prager, 2016). American Indian women experience higher adverse childhood experiences (ACE; 51%) that accounted for lifetime depression, poly-drug use, PTSD, and suicide (Brockie et al., 2015).

Anishinaabe female prostitutes worked for service agencies in three Minnesota cities and studies determined the social and physical violence they suffered (Farley et al., 2016). The participants expressed that prostitution was normal in childhood during foster care and when they were arrested included experiences of homelessness, rape, assault, racism, and pimping (Farley et al., 2016). The women's contemporary social experiences were connected to colonization and vulnerability to sexual exploitation (Farley et al., 2016). Seventy percent of AI/ANs who lived in urban areas experienced high levels of alcohol and drug use sometimes disregarded in research (Dickerson et al., 2016).

AI/ANs showed resilience against stressful life events, but resilience has broken down over centuries, eroding the current health of individuals, families, and communities (Evans-Campbell, 2008). In a study of discrimination among AI/AN youth, past perceptions of discrimination triggered psychological stress and race-based trauma

(Bombay et al., 2013; Cohen, 2016). The authors stressed that the AI/AN with eroded resilience is highly susceptible to discrimination (Bombay et al., 2013; Evans-Campbell, 2008). Furthermore, researchers found a lack of healthcare for racial/ethnic minority groups was due to discrimination or provider bias against individuals who suffered from cardiovascular disease, cancer, renal disease, asthma, mental illness, diabetes, and HIV/AIDS (Kressin, Raymond, & Manze, 2008; Raglan et al., 2016; Ryan et al., 2008).

Microaggressions

Sue et al. (2007) described microaggressions as daily events of discrimination, racism, and hassles of ethnic groups in the form of microassaults, microinsults, and microinvalidations. In addition, Jones and Galliher (2015) found that poor mental health laid the foundation for sensitivity to discrimination. Effective treatments for AI/AN substance-use disorder and other chronic health problems considered racial discrimination and historical trauma (Canel-Çınarbas & Yohani , 2019; Skewes & Blume, 2019).

Microaggressions are referred to as contemporary racism developed from ethnic apprehension and prejudice that is not clearly understood by the recipient (Druck et al., 2019; Michaels et al., 2018; Salter et al., 2018; Skewes & Blume, 2019; Sue et al., 2008). Many researchers point out that microaggressions are devious, insulting, impulsive understatements that are inappropriate to the Native individual (Lukianoff & Haidt, 2015; Pierce et al., 1978; Skewes & Blume, 2019). Jones and Galliher (2015) and Skewes and Blume (2019) reported Indigenous recipients of high levels of microaggressions resulted in greater stress, depression, and alcohol use. However, some researchers concluded that

more longitudinal research studies are necessary of individuals experiencing daily microaggressions to substantiate the present microaggression theory (Druck et al., 2019; Huynh, 2012; Ong & Burrow, 2017; Wong et al., 2014).

Type-2 Diabetes Mellitus

Diabetes Types

High blood glucose levels are caused from impaired insulin use in the body that characterized T2DM or when the body could not deal with high levels of insulin production (Corkey, 2016). Corkey (2016) reported that T2DM could be better defined considering the fat triangle. The fat triangle consisted of excess fat tissue deposits on the body that released triglycerides and free fatty acids into the blood stream (Corkey, 2016). The fat tissue was then transported from the blood stream to the pancreas (Corkey, 2016). In the pancreas, the fat tissue was internalized and converted into free fatty acids and the process that triggered insulin secretion (Corkey, 2016). Corkey (2016) found that the high levels of insulin secreted by excess fat tissue are carried into the pancreas via the blood stream to the liver and, would over time, stop glucose production because it overloads the liver, muscle, and fat. By the time symptoms appear muscles, liver, and fat cells do not use insulin properly and is referred to as insulin resistance (ADA, 2017a; National Institute of Diabetes & Digestive & Kidney Diseases [NIDDK], 2016). The dysfunction caused chronic hyperglycemia or high blood glucose and results in T2DM (Curry, 2014).

Diabetes is the most common metabolic disease in the world and consists of several types of diabetes. For instance: (1) T1DM; (2) T2DM; (3) gestational diabetes; (4) prediabetes; (5) monogenic diabetes syndrome; neonatal diabetes or maturity onset of

the young (MODY); (6) diseases of the exocrine pancreas (e.g., cystic fibrosis); and (7) drug induced diabetes (e.g., during HIV/AIDS treatment or organ transplantation; ADA, 2017a). T1DM is diagnosed after the pancreatic islet beta cells are destroyed and begins earlier in life than T2DM (Attridge et al., 2014). Insulin therapy is necessary for T1DM because the pancreas does not function (Attridge et al., 2014). Järvelä et al. (2006) found that pregnancy predicts diabetes in the future of patients. A study of Finnish women found that after gestational diabetes half the women developed T1DM and the other half T2DM (Callaway et al., 2006).

Cefalu (2016) found when individuals had a high or low risk of diabetes (prediabetes) the lower end of the blood glucose developed slower. In 2010, there were 79 million prediabetes individuals in the USA and that may account for the increase in Americans 20 years and older in 2012 of 86 million (ADA, 2016). Jiang et al. (2016) reported that adiponectin (a protein hormone that regulates many metabolic processes including glucose regulation) is a very strong risk marker for prediabetes. The researchers indicated that adiponectin is significantly associated with the process from prediabetes to T2DM (Jiang et al., 2016). Thus, by monitoring prediabetes individuals' HbAlc levels of adiponectin it may be more noticeable and could prevent or may prolong 86 million individuals from having T1DM or T2DM (ADA, 2016; Jiang et al., 2016).

If adiponectin levels are measured early in life a newly developed probiotic formula could decrease T2DM (Palacios et al., 2017). Palacios et al. (2017) assessed the affect and safety of a probiotic formula for the management of prediabetes developing into T2DM. Although the study was over 12 weeks the researchers emphasized they were

investigating the short-term effect of a multi-specific probiotic formula to improve fasting blood glucose levels (Palacios et al., 2017).

In addition, ADA (2016) suggested the standard tests for T2DM be revised and asymptomatic adults tests for diabetes begin at 45 years or at any time if they are obese or have any other diabetes risk. It included fasting plasma glucose, a two-hour blood glucose, a 75-gram of oral glucose for the tolerance test, and HbAlc criteria (ADA, 2016). The probiotic formula managed prediabetes over short periods of 4-6 weeks while the fasting blood glucose levels were checked (ADA, 2016; Callaway, McIntyre, Barrett, Foxcroft, Tremellen, Lingwood, ... & O'Rourke, 2019; Kijmanawat, 2019). Furthermore, Herman (2012) reported that when impaired fasting glucose (IFG) occurred T2DM is inevitable. However, it could be suspended or prevented by using intensive lifestyle counseling interventions (Herman, 2012).

Prevalence and Health Disparity for T2DM

The worldwide diabetes endemic increased four-fold since 1980, and regardless of treatments, the figure rose to 422 million adults (WHO, 2016b). By 2040, diabetes was predicted to reach 642 million adults (10.4%; Harris, Tompkins, & TeHiwi, 2016). In 2014, 90%-95% of individuals worldwide have T2DM and an expected escalation of 439 million by 2030 (Wu et al., 2014). Guariguata et al. (2014) estimated diabetes would increase from 382 million (2013) to 592 million (2035). A forecast of global diabetes in 2030 would be 552 million or more individuals with diabetes particularly since rates continue to rise (Barnard, Peyrot, & Holt, 2012; WHO, 2016). Zhu et al. (2019) found obesity in early pregnancy was a high risk factor for gestational diabetes.

In 2012-2017, according to the American Diabetes Association (ADA), 29.1 million (9.3%) Americans have diabetes and of this figure 1.25 million have type-1 diabetes (2017). Of the 29.1 million (9.3%), only 21.0 million knew they had diabetes, whereas 8.1 million (28%) are undiagnosed and not aware that they have diabetes (DiBenedetto et al., 2016; CDC, 2014a; Harris et al., 2016). Eighty-six million prediabetes individuals with HbAlc levels of 5.7% to 6.4%, 20 years and older, are unaware of their condition (DiBenedetto et al., 2016; CDC, 2014a). The HbAlc test provided individual's average blood sugar level over the previous three months (CDC, 2014a). The number of undiagnosed diabetes individuals could decrease if, in the future, they were made aware of their condition (CDC, 2014a). In the USA, every 23 seconds there is someone diagnosed with diabetes (ADA, 2017a).

The highest rates of diagnosed diabetes among all ethnic groups in the USA are the AI/ANs (15.9%), with non-Hispanic Whites (7.6%); Asian Americans (9.0%); Hispanics (12.8%); and non-Hispanic blacks (13.2%; ADA, 2017a). However, the majority of individuals diagnosed globally with diabetes are T2DM (90%) and more than 50% of them are indigenous adults older than 35 years (WHO, 2016a). Between 1967 and 1977 the National Institute of Health (NIH) and Indian Health Services (IHS) studied diabetes among the Pima Indian community in Arizona, USA (Booth et al., 2017; Harris et al., 2016; Schulz & Chaudhari, 2015). The authors found that about 50% of the Pima Indian adult's aged 30-64 have the highest rates of diabetes in the world and the majority of these individuals had T2DM (Harris et al., 2016). Hsueh et al., (2018) found in the

USA Pima Indian's chromosomes are higher relative to diabetes and obesity than Mexican Pima Indians although they were from the same descendants.

There are approximately 6.8 million AI/ANs and 573 Tribes, and diabetes prevalence among adults of 2.3 times higher than non-Hispanic Whites in the USA (Census.gov, 2018; Cho et al., 2014; Crowshoe et al., 2018; IHS, 2016a; Nicklett et al., 2016). Since 2009, T2DM increased among AI/ANs compared to non-Hispanic groups in the USA (16.1% vs. 7.1%, 2009 to 18% vs. 8%, 2016; O'Connell et al., 2012; Rosas et al., 2016; Sutherland & Tulkin, 2012). The four Wabanaki Indian tribes (Maliseet, Micmac, Passamaquoddy, and Penobscot) diabetes mortality rates increased from 59.2% in 1990 to 68.3% in 2009 (Martin et al., 2014). The Mexican Pima Indian women with T2DM increased from 18.9% in 1995 to 36.3% in 2010 (Esparza-Romero et al., 2015).

Causes and Symptoms of T2DM

Scientists do not know the exact cause of T2DM, but they are familiar with the many associated risk factors (ADAP, 2015). Lifestyle causes of T2DM are overweight, obesity, and physical inactivity (Gamble, Eley, & Southard, 2020; NIDDKD, 2016; Zhu et al., 2019), and included a lifestyle of high fat and high sugar diet (Fukui, 2016). T2DM is diagnosed after symptoms appeared due to continual sedentary behavior, incorrect diet, and stress (ADA, 2015b). Diabetes symptoms included thirst, constant urination, hunger after eating, fatigue, blurry vision, slow healing of cuts and bruises, tingling, or numbness in hands and feet (ADA, 2015a; NIDDK, 2016; Powers et al., 2015). When diabetes was diagnosed it was not always clear what type of diabetes it was until long after diagnoses (Cefalu, 2016).

Gender Differences in T2DM

In a cross-sectional study of T2DM patients, researchers found a relationship between gender and patient knowledge, skills, and confidence in managing their T2DM (Hendriks et al., 2016). Hendriks et al. (2016) suggested self-management tasks prescribed by healthcare providers should consider the gap of gender to achieve better results with T2DM. Men's health depended on age, wellbeing, and BMI whereas women's health focused on well-being and macrovascular issues (Hendriks et al., 2016). T2DM women were found to be more susceptible to coronary heart disease than men due to elevated blood pressure, low HDL cholesterol, and high triglycerides (Juutilainen et al., 2005). Women with T2DM are 2.2 times more susceptible to cardiovascular disease (CVD) than women without T2DM (Witt, Boucher, & Hayes, 2013). During a 2-hour standard oral glucose tolerance test (OGTT), women took longer to metabolize 75 grams of glucose (Witt et al., 2013).

During menopause insulin sensitivity and estrogen levels decreased and adipose tissue (fat) filled subcutaneous (under the skin) compartments in women whereas men filled visceral (gut) fat compartments (Faerch, 2013). Women were more at risk of developing T2DM sooner than men, but this has changed over time because men have become more sedentary and have developed more visceral fat than the stipulated body mass index (BMI; Faerch, 2013). Hence, the visceral distribution for gender determines insulin resistance and makes men vulnerable to T2DM whereas it makes women more at risk for coronary heart disease (Faerch, 2013). Faerch (2012) suggested developing T2DM self-management programs separately for male and female T2DM individuals that

could produce more accurate results among diabetes patients. However, central or abdominal obesity in early pregnancy allow higher risk of T2DM (Zhu et al., 2019) and may be the link of high levels of obesity and T2DM among AI/AN women (Fialkowski et al., 2010).

AI/AN women with T2DM also had maternal concerns regarding diabetes (Carson et al., 2015; Kim et al., 2015; King et al., 2012). They feared the effects of mechanical acts (injections) and the medical and diabetic complications (Carson et al., 2015). Anxiety caused by diabetes resulted in negative effects in utero and included the use of insulin injections, blindness, amputation, and death (Carson et al., 2015; King et al., 2011: Lindberg et al., 2012). AI/AN women were also at high risk of poor pregnancy outcomes because of increased obesity, lack of prenatal care, and pregnancies at a younger age (Alexander, Harder et al., 2007; Boulet et al., 2003; Wingate, & Boulet, 2008). AI/AN infant mortality rates were second highest in the USA in 2006 with 8.3 per 1,000 live births (Patterson, 2016).

Federal Funding for AI/AN Type-2 Diabetes

For many years T2DM has substantially increased among AI/ANs and caused highest levels of illness and mortality due to lack of funding. In 2016, federal funding became available for the Special Diabetes Program for Indians (SPDI) for 3 years (IHS, 2016a). More recently, the Urban Indian Health Organizations (UIHO; 2016b) that are private, nonprofit, corporations provide health and social services funded by the federal IHS in 19 states and in about 100 U.S. counties for more than 1.2 million AI/ANs. The UIHO registered 13,311 patients from 2011 to 2015 that included AI/ANs aged 18 years

and older. Most of the patients are female with a mean of 52 years, 57% are between the ages of 45-64 years, and 9% newly diagnosed diabetes patients (UIHO, 2016).

The SDPI (2019) program made no impact on endemic diabetes as seen in past statistics presented by the UIHO (2016) that recently reported a 58% improvement (National Indian Health Board [NIHB], 2015). The SDPI established in 1997, attended to the diabetes needs in AI/AN areas and provided 404 programs in 35 states and about 325-450 grants awarded annually until December 31, 2020 (Federal Register, 2015; National Indian Health Board, 2015). Federal funding was reauthorized in 2016, for the SDPI and included $150 million per year for three years (Federal Register, 2015; National Indian Health Board, 2015, 2019). Further, the federal funding budget for 2016 proposed and approved $6.6 billion for IHS (an increase of $402 million over the fiscal year 2016) to reduce health disparities in Indian country (U.S. Department of Health and Human Services-Funding [DHHS], 2016). However, the Federal Register (2015) reported an urgent need for strategies to prevent and treat AI/ANs with T2DM. According to the Federal Register (2015), reports indicated 58% improvement in AI/AN T2DM in 2016 and at this stage the need is for prevention and cure.

Poverty, Diet, Obesity, Stress, and Type-2 Diabetes

Poverty

Bray (2015) and Satterfield (2016) found that T2DM developed over time by eating poor unbalanced meals especially with inactive individuals. However, diabetes and obesity increased tooth decay among the Pimas living in Mexico until high taxes were placed on sugared soft drinks (Bray, 2015; Satterfield, 2016). In many cases, poverty-

stricken T2DM patients had other barriers to self-management such as low health literacy, poor quality housing, shift work, stress, inability to access healthy food that affected adherence to medication regimens (Brundisini et al., 2015; Fagherazzi et al., 2019; Satterfield, 2016). Bray (2015) found a barrier to self-management of T2DM was to access healthy food when poor. Milo & Connelly (2019) found lack of education was associated with poor T2DM self-management. In some cases among Canadian First Nations people, individuals only afforded one meal a day (Bray, 2015). Jones-Smith et al. (2013) found diabetic individuals in higher income brackets in healthy and unhealthy food environments were not obese. Diabetic individuals in the lower income bracket exposed to healthy and unhealthy food environments were obese (Jones-Smith et al., 2013; Webster, 2018). Food environments in the study were identified as supermarkets and produce markets as healthy, and unhealthy food vendors classified as fast food restaurants and convenience stores (Cobb, Appel et al., 2018; Webster, 2018). The importance of food environments was understated in many studies and could be the cause of overweight and obesity that are precursors to T2DM (Callaway et al., 2019; Cobb et al., 2015; Webster, 2018).

Diet

Traditionally, AI/ANs cultivated crops, hunted, or gathered foods from the wilderness (Boyce & Swinburn, 1993; Hrdlicka, 1908). However, during colonization, AI/AN tribal traditional way of eating were replaced with military rations such as white flour, baking powder, and lard used to make fry bread, and now associated with the AI/AN diet (Joe, 2016; MacDonald & Steenbeek, 2015). The government supplied salt,

pork, bacon, potatoes, beans, sugar, coffee, and tea that over time drastically affected AI/AN health and wellbeing (Joe, 2016). Researchers also found AI/AN women do not choose costly foods or have no access to healthy foods versus the availability and overabundance of unhealthy foods that resulted in obesity and illness in self, family, and community (Gadhoke et al., 2015). Both Joe (2016) and Gadhoke et al. (2015) found the military rations became a staple food among AI/ANs that caused high levels of obesity.

Traditionally, AI/AN diet consisted of low-density energy foods (Satterfield, 2016). Satterfield (2016) found that tribal solutions to diabetes and chronic illness meant reclaiming ancient food and related physical activity with the help of social support systems. Historically, researchers and authors of AI/ANs' traditional way of life reported AI/ANs thrived on healthy diets of low-density energy foods (Walters & Simoni, 2002). Energy foods were produced and prepared by AI/AN women who represented the life giver, mother, wife, healer, teacher, gardener, and cook (Walters & Simoni, 2002).

The Recommended Dietary Allowance (RDA) guidelines for healthy diets ignored serious ill-health implications caused by poor guidelines (Eilat-Adar et al., 2009). Eilat-Adar and associates reported the reason for AI/AN high levels of obesity was their ignorance of RDA expectations (2009). For example, fat intake should range from 31%-47% (Eilat-Adar et al., 2009). Researchers found a relationship between AI/AN consumption of high levels of saturated fat elevated risks of cardiovascular disease (Ebbesson et al., 2007). The consumption of fat, saturated fat, and sodium in AI/AN diets have led to chronic diseases such as T2DM (Fialkowski et al., 2010). Quandt et al.

(2013), and Story et al. (1999) found AI/ANs consumed food with high cholesterol and sodium.

Excessive consumption of carbohydrates cannot metabolize in the system and changes into glucose and collected in the blood stream (CDC, 2014a). The body's energy use was the metabolic rate while in a passive and active mode and associated with body weight needs to store energy, maintain heat, and to work by moving and lifting (Herman, 2016). The metabolism of many AI/AN women with T2DM resulted in the inability to cope with food from food deserts (convenient stores and fast food outlets) that are more available to them that led to poor blood sugar level control (Carlson, et al., 2018; Fretts et al., 2018; Gadhoke et al., 2015; Joassart-Marcelli, Rossiter, & Bosco, 2017).

Obesity

Obesity across the globe among high and low income countries are the result of dietary sugar and fat and sedentary behavior that is the leading cause of death (Blüher, 2019; Mojto et al., 2019). Obesity in early pregnancy increased risk of gestational diabetes that led to T2DM and encouraged the intergenerational cycle of obesity and T2DM in offspring (Cunningham et al., 2014; Stotz et al., 2019; Zhu et al, 2019). The highest obesity rates in the United States were among AI/ANs (23.9%) compared to the other ethnic groups (18.7%; Trude et al., 2015) and 2.8 million Americans indirectly die from obesity annually (Steinfeld, 2018). Obesity leads to diseases such as T2DM, cancer, hypertension, cardiovascular disease, and stroke (Trude et al., 2015). Gadhoke et al. (2015) and Yracheta et al. (2015) reported obesity was 40% prevalent among all AI/AN adults due to poor diet (18% have diabetes). However, a year later Rosas et al. (2016)

reported a lower rate of obesity of 36%. Insulin resistance was linked to extra belly fat (central obesity or abdomenal obesity), T2DM, and heart and blood vessel disease (ADA, 2017a; NIDDK, 2016; Zhu et al., 2019). Diabetes among Mexican Pima women significantly increased (from 18.9% in 1995 to 36.3% in 2010) because they chose to eat available and affordable modern foods high in carbohydrates (Esparza-Romero et al., 2015; Hrdlcka,1908; Schulz & Chaudhari, 2015).

Schulz and Chaudhari (2015) carried out a long-term study that was initiated in 1965 with the Pima Indians of Arizona. These researchers discussed gene-environment interactions with bacterium or viruses (pathogenic) that contributed to diabetes and epidemiology, physiology, clinical assessment and the genetics of T2DM and obesity (Schulz & Chaudhari, 2015). Around 300 B.C., the Pima Indians inhabited the Sonoran desert and Sierra Madre regions in Mexico for many centuries then moved to the Gila River valley in the Mexican territory (Schulz & Chaudhari, 2015). In 1853, the United States acquired this area from Mexico through the Gadsden Purchase now referred to as part of Arizona (Schulz & Chaudhari, 2015). In 1959, a Pima reservation in Arizona was created and they adapted to the desert environment (Schulz & Chaudhari, 2015).

The Pima Indians developed irrigation systems to grow corn, beans, squash, and cotton (Schulz & Chaudhari, 2015). In the 1900s, White settlers diverted the water away from the Pima reservation that prevented farming, lack of food, and labor (Schulz & Chaudhari, 2015). The Pima Tribe’s diet changed and so did physical activity and it was probably at this point in time when diabetes began to develop (Schulz & Chaudhari, 2015). Records indicated one case of diabetes was found among the Pima Indians when

they lived on the Gila River Reservation (Hrdlicka, 1908). Joslin (1940) reported that by 1937 the diabetes statistics for the Pima Indians and for the USA at the time was similar.

Diabetes increased ten-fold among the Pima Indian and by 1950 diabetes was the highest ever recorded (Bennett, Burch & Miller, 1971). Booth et al. (2017) and Spero (2015) reported that the Pima Indians have the highest prevalence of T2DM on the globe. In the United States, the Pima Indians live a modernized lifestyle, use technology, and eat processed foods that results in T2DM and increased obesity (Esparza-Romero et al., 2015; Hu, 2011).

Stress

Kelly and Ismail (2015) found that most policy and research centered on T2DM were behavioral issues. The physiological stress responses that emanated from chronic exposure to stressors, low socioeconomic status, severe mental health problems, or aggressive behavior increased the risk of T2DM (Kelly & Ismail, 2015). T2DM affects many regions in the body and weakens genetic locations that respond to various environments and behaviors especially among women (Chen et al., 2012). Steptoe et al. (2014) found stress related processes are linked to biological dysfunction in T2DM especially with prolonged stress. Many patients experience long-term stressors that prevent management of T2DM (Novak et al., 2013; Osborn et al., 2014). Stressors such as T2DM, financial concerns, access to healthcare and insurance, food insecurity, and housing instability are self-management barriers (Chlebowy et al., 2010; The Lancet, 2017).

Furthermore, Iwasaki, Barlett, and O'Neil (2004) found stress experienced by Canadian Indians with diabetes were only related to health-related issues. It included the physical stress and psychological stress of managing diabetes (Iwasaki et al., 2004). It also included fears of the future, suffering complications, and financial aspects of living with diabetes (Iwasaki et al., 2004). There are also marginal economic conditions such as poverty and unemployment (Iwasaki et al., 2004). In addition, trauma and violence such as abuse, murder, suicide, missing children, bereavement, cultural, historical, and political aspects contributed to Aboriginal individuals with T2DM stress that resulted from deep-rooted discriminations (microaggressions) and self-identification problems (Iwasaki et al., 2004; National Public Radio, 2017). Black students were exasperated and overburdened in efforts to educate the microaggressor at White colleges and universities of Black intellect, history, culture, and diversity but found it a useful tool (Morales, 2020; Nadal et al., 2012). Nicklett and Damiano (2014) reported that women with diabetes experienced socioeconomic disparities. They also experienced social suffering consequences that were due to political, economic, and institutional power (Nicklett & Damiano, 2014). The women who experienced these social challenges suffered health issues (Nicklett & Damiano, 2014).

After one stressful experience, the endocrine system produces hormones and enzymes then returns the body to homeostasis (Zorea, 2014). Novak et al. (2013) discovered that self-perceived permanent stress was a long-term predictor of diagnosed T2DM. Other typical T2DM contributors are obesity, poor diet, and sedentary behavior. In a 35-year follow-up study, Novak et al. (2013) investigated a sample of 7251 men

aged 47-56 years with no history of diabetes, coronary heart disease, or stroke (Novak et al., 2013). Novak and colleagues established that men with permanent stress were at high risk of diabetes [hazard ratio 1.52 (95% CI 1.26–1.82)] compared with men with no (referent) or periodic stress [hazard ratio 1.09 (95% CI 0.94–1.27)] (2013).

Similarly, Steptoe et al. (2014) confirmed that when the body tries to return to homeostasis and cannot after continuous stressful life events it contributes to T2DM. Stress-related processes affected multiple areas of the body that made the individual more susceptible to T2DM (Steptoe et al., 2014). Thus, Steptoe et al. (2014) found that long-term stress predicted T2DM when stressful life events affected many parts of the body. If AI/ANs experience long-term stress from an early age for generations it contributes to endemic T2DM (Steptoe et al., 2013).

The unbalanced physical and mental condition of the individual experiencing trauma disallowed management of stress or T2DM (Steptoe et al., 2014). According to Wilkinson et al. (2014), it was imperative that T2DM be self-managed as mortality, morbidity, loss of quality of life, and high costs involved are inevitable. AI/ANs with T2DM understood that mismanaged T2DM resulted in serious complications because many family and friends experienced T2DM complications that resulted in mortality (Carson et al., 2015).

These events contributed to the development of T2DM or further aggravated the T2DM condition (Beasely et al., 2003; Soto et al., 2015; Steptoe et al., 2014). However, in many cases AI/AN women with T2DM exposed to historical and contemporary trauma were already vulnerable to pathological dysfunction (Gone, 2013). Gone and Trimble

(2012) suggested that historical trauma effects are explained as pathological distress: (a) directly associated with historical atrocities, (b) it strengthened AI/AN cultural identity (that is the core of AI/AN individual), and (c) defied resistance to therapy change that shifted guilt from self and betrayed ancestor's negative experience.

Diabetes Self-Management

The purpose of the diabetes self-management education (DSME) program was to provide newly diagnosed patients with information and knowledge for daily decisions about food, exercise, and medications (see ADA, 2015b; Fukunaga et al., 2011; Powers et al., 2015; Toobert et al., 2000). In addition to the DSME program, there was the modified plate method; a dinner plate marked down the middle and one section divided to present three sections (ADA, 2017b). The largest section was filled with non-starchy vegetables, the one small section was for protein, and the other small section was for grains or starchy foods (Bowen et al., 2016a). Bowen et al. (2016a) found the modified plate method significantly improved HbAlc levels by 7-10%.

However, there are many approaches to self-management of T2DM (Hingle et al., 2017). For instance, the T2DM glycemic load, exercise, and monitoring (GEM) blood glucose self-management program that included weight loss, avoidance of high-energy foods, 150 minutes of weekly exercise, and monitoring of blood glucose (Cox et al., 2016). In addition, Cox et al. (2016) found that postprandial glucose (PPG) measured blood glucose levels postprandial (after meals) often and by eating low-glycemic foods at each meal so that spikes in blood sugar did not occur (Cox et al., 2016). The latest idea considers dietary energy density defined as the ratio of energy (kcal) to food weight

(Hingle et al., 2017). These low-density energy foods consisted of vegetables, whole grains, and beans while high energy density foods consisted of sugar-sweetened beverages, fried foods, and processed sweets (Hingle et al., 2017).

Powers et al. (2015) found healthcare providers needed to learn about T2DM self-management and apply diabetes self-management education (DSME) to meet diabetic needs. Healthcare providers should teach culturally-oriented self-management education, screen for detection of T2DM, check for diabetes complications that could improve the T2DM individual's quality of life (WHO, 2016b). Researchers found tailoring existing T2DM interventions specifically for the individual's needs particularly with chronic disease (e.g., cardiovascular disease, cancer symptoms, and gastrointestinal issues) would motivate self-management of the disease (Muchiri et al., 2018; Jerniganer al., 2020; Maine et al., 2017). The *Standards of Care Guidelines* of the American Diabetes Association consensus report for professionals included nutritional therapy with a realistic approach to cultural backgrounds, personal choices, comorbidities, and socioeconomic status for individuals with prediabetes, type 1 diabetes, and or T2DM (Cummings et al., 2019; Evert et al., 2019).

Wu et al., (2014) found that T2DM barriers to self-management would eventually lead to subcutaneous insulin injections that requires extra management. Huang and Cheng (2016) confirmed that psychosocial demands challenged T2DM self-management and decreased quality of life. The identification of self-management barriers was vital to reduce the adverse effects of T2DM associated with high mortality, morbidity, loss of quality of life, and high costs (Nesdole et al., 2014; Wilkinson et al., 2014). External

factors that continuously interfere with T2DM self-management are social determinants of health and individual diabetes needs (Clark & Utz, 2014; Nesdole et al., 2014). Social determinants consisted of social-ecological influences that affected health such as the built environment, healthcare, social and community support, economic stability, and education (Clark & Utz, 2014). The built environment includes transportation, neighborhood safety, and healthy food (Clark & Utz, 2014). Lower socio-economic situations prevent diabetes individuals from accessing healthy foods (Evert et al., 2019; Jones-Smith et al., 2013). T2DM individuals living in poor environments such as inner cities and rural areas did not have access to healthcare and it became a barrier to self-management of T2DM (Clark & Utz, 2014). Individuals with education are inclined to eat healthier and attended to their personal needs (Clark & Utz, 2014).

Brundisini et al. (2015) found in a qualitative meta-synthesis study regarding T2DM medication adherence that internal factors such as positive emotions empowered self-management of T2DM. Negative emotions worsened T2DM adherence (Brundisini et al., 2015). Accordingly, when healthcare providers heed T2DM anxiety and negative emotions concerning diabetes and treat it with cultural educational tools it increased T2DM self-management ability (Patel, Davila, Patel, & Norman, 2014). The Canadian Coeur d'Alene Tribal Indian constantly desired self-management education that included caring and culture within the tribe, for the tribe, and by the tribe for nurses to understand their needs better and to help them with acceptable and compassionate self-management training (Evert et al., 2019; King, 2011; Tiedt & Sloan, 2015).

Negative emotions were known to motivate women to self-manage T2DM (Brundisini et al., 2015; Cummings et al., 2019). In many cases, negative emotional experiences including fear, self-blame, guilt, shock, helplessness, and frustration that improved or discouraged T2DM self-management (Brundisini et al., 2015; Cummings et al., 2019). Similarly, AI/ANs reported being frustrated with the healthcare system and lack of historical trauma treatment that contributed to mental illness (Gone & Trimble, 2012). The T2DM patient's fear of hyperglycemia (high blood glucose) or hypoglycemia (low blood glucose), early death, and T2DM complications were found to encourage self-management (Brundisini et al., 2015). However, Insko, Arkoff, and Insko (1965) found that instilling fear in smokers to prevent smoking depended on who was provoking fear because individuals could become defensive and rebellious rather than agreeable, or experience fear, self-blame, guilt, shock, helplessness, and frustration and ignore self-management.

Observing other diabetes patient's complications and sufferings in family and community encouraged self-management (Brundisini et al., 2015). The consequences of individuals who failed to adequately self-manage diabetes would inevitably suffer distress, anxiety, and depression that resulted in development of heart disease, hypertension, kidney failure, and blindness (Brundisini et al., 2015; Goins et al., 2017; Pouwer et al., 2020). In contrast, T2DM individuals who became sick and frightened were more willing to self-manage (Brundisini et al., 2015). Some T2DM patients deliberately refused to adhere to medication application (Brundisini et al., 2015). Attridge et al. (2014) found that culturally-oriented education improved diabetes in ethnic

minority groups. T2DM patients educated by healthcare providers in a culturally appropriate way encouraged compliance and reduced the dire consequences of mismanaged T2DM (Attridge et al., 2014; Brundisini et al., 2015; Micikas et al., 2016; Tiedt & Sloan, 2015). However, Gomersall et al. (2011) found in a meta-analysis of self-management of T2DM that there were many complex factors that affected diabetes self-management. Although the individual was responsible for self-management they finally concluded that the "inner" world, the social, and the political circumstances determined the individual's diabetes experience (Gomersall et al., 2011).

Self-management barriers may be the daily situational, cultural, and social issues presented to the T2DM individual (Evert et al., 2019; Wilkinson et al., 2013). Some T2DM individuals justified mismanagement by denying the seriousness of diabetes (Brundisini et al, 2015). Other T2DM patients mistrusted healthcare providers' treatment and fear unnecessary, unhealthy, or dangerous beliefs about medications, side effects, or they adjusted medication dosages themselves (Brundisini et al, 2015). Brundisini et al. (2015) found the complexity in daily administering of medication at a given time was to develop an individual T2DM routine. The routine included the responsibilities of childcare, domestic duties, or work schedules that could become barriers to T2DM self-management (Brundisini et al., 2015). In a study among T2DM Lumbee Indians that live in Southeastern North Carolina, researchers found self-management was important to them and felt comfortable taking medication (Jacobs et al., 2014). However, they felt reluctant to make long-term lifestyle commitments (Jacobs et al., 2014).

Healthcare Providers and Self-Management

The healthcare provider's supportive attitude toward the patient's self-management ability increased patient's interest. Diabetes healthcare for diabetes or prediabetes for adults included nutrition therapy as part of ADA 2019 *Standards of Care* guidelines (Evert et al., 2019). Brown-Rice (2013) pointed out that healthcare providers should properly understand historical trauma and its association with T2DM so that relative treatment was received. The ultimate healthcare provider was patient-centered, with a biopsychosocial perspective, treated the patient as a person, with power and responsibility, therapeutic alliance, a doctor-as-person approach, negotiated, and encouraged a two-way communication process (Mead & Bower, 2000). Additionally, decisions made by healthcare providers included the T2DM patients input especially if historical trauma symptoms were detected (Jacob et al., 2013). Further, patients found that treatment was impractical because healthcare providers were unaware of patient's daily way of life (Brundisini et al., 2015). However, the ADA previous nutrition consensus report was updated and focused on the adult individual with diabetes and prediabetes and their needs that included medical management and nutritional counseling for better self-management (Evert et al., 2019).

Evidence showed that interaction between patient and nurse practitioners predicted efficient self-management of diabetes **(**Wijnands-van Gent et al., 2016). Moreover, nurse practitioners examined diabetes self-management interventions and found them ineffective especially among ethnic groups that were more frequently sampled (67%) in research than non-Hispanic individuals (Evert et al., 2019; Wijnands-

van Gent et al, 2016). After their study, nurses found that diabetes self-management standard treatments expected by Medicare, Medicaid, and commercial insurers offer ten hours of education followed by 4 hours each following year (Lew et al., 2014). It was not adequate education for a life-long disease such as diabetes (Lew et al., 2014). There was a discrepancy between what patients think was self-management and what healthcare providers expected from patients as self-management (Brundisini et al., 2015). Many researchers found that problems negatively influenced patient's self-management ability due to lack of cultural treatments, unsatisfactory provider care, and patient's input were excluded (Brandisini et al., 2015; Micikas et al., 2016; Tiedt & Sloan, 2015). Other indigenous studies found that AI/AN communities improved physical and mental conditions if a holistic and cultural approach was implemented (Tucker et al., 2014; Walls et al., 2014). More recently, ADA published a consensus report that included therapy to individualize nutrition for adults with prediabetes, T2DM, and type-1 diabetes (Evert et al., 2019).

Other researchers recommend culturally sensitive, empowerment-focused, community-based health programs for AI/ANs with T2DM that improved health (Tucker et al., 2014). In some cases, healthcare providers encouraged diabetes doctors partner with traditional healers or elders to treat the AI/AN spirit (Sanderson et al., 2012). AI/AN community clinics were willing to manage their own healthcare programs with tribal leaders to advance their knowledge in healthcare (IHS, 2017b; Schure et al., 2018). Alternatively, if healthcare providers used cultural education to eliminate T2DM patient's anxiety and negative emotions it increased T2DM self-management ability (Patel et al.,

2014). Brundisini et al. (2015) found when T2DM patients experience positive health benefits it empowered their self-management ability.

T2DM prevention required nondiabetic, high-risk individuals prevented T2DM by focusing on weight loss, diet change, and increased physical activity (Knowler & Ackermann, 2013). Losing weight and managing obesity improved blood glucose levels considerably, especially with insulin resistance or T2DM that caused reversible beta-cell dysfunction (ADA, 2016). However, some T2DM individuals did not want to lose weight or could not keep their weight down (Cox et al., 2016). A lifestyle modification program with preventative measures such as glycemic load, exercise, and monitoring (GEM) was used for individuals needing to lose weight (Cox et al., 2016). In more extreme cases, prevention and recommendations for weight control included dietary, pharmacological, and surgical intervention for obesity management as treatments for hyperglycemia in T2DM (ADA, 2016). However, those needing pharmacological or bariatric surgery should carefully select an appropriate method (ADA, 2016; Guida & Ramracheya, 2020). Therefore, if a patient mismanaged T2DM obesity it was inevitable, and as ADA suggested, pharmacological or bariatric surgery was necessary (2016).

Nadeau et al. (2016) found with exponential T2DM escalations in the world the need to understand T2DM by researchers and healthcare providers prevented future complications and psychosocial risks. Recently, protocol from the American Diabetes Association regarding nutrition therapy was part of the ADA Standards of Care Consensus Report to specifically provide clinical professionals with the knowledge and understanding to treat diabetes individuals with T2DM (Evert et al., 2019). Stakeholders

in industry, academic, funding agencies, advocacy groups, and regulators should understand T2DM patients' culture and lifestyle for intervention development (Blanchard et al., 2015; Nadeau et al., 2016). Psychosocial strategies were vital for diabetes treatment and used significantly more to help the AI/AN women with T2DM build resilience against historical trauma and contemporary trauma (Butts et al., 2018; Peyrot et al., 2006; Walls et al., 2014) and Pouwer et al. (2020) found that some healthcare providers overlooked the great need for psychology in treating T2DM distress, depression, anxiety, and eating disorders. About two out of three T2DM patients suffer psychological issues and undiagnosed were more vulnerable to psychological problems especially related to T2DM anxiety (Johansen et al., 2014). Evert et al. (2019) and Cummings et al. (2019) found clinical counseling or nutrition therapy along with medical management encouraged patients T2DM and their individual mental and physical needs.

AI/AN Culture and Healthcare

Nicolas, Wheatley, and Guillaume (2015) described culture as more than race, ethnicity, and ancestry; it was a framework of an individual's physical existence, values, and identities that include morality, health, illness, and acceptable behavior. Trimble et al. (2014) emphasized the importance of knowing that the term AI/AN was a political term used to refer to the culture and was not the true description of the diversity of racial, ethnic, or culture encapsulated in the AI/AN society. Researchers found First Nations (Canadian Indians) diabetes ranged from 1.2% to 18.3% and the difference was due to cultural continuity defined as culture that continued although exposed to continuous change and where origins of the culture remained (Oster, Grier, Lightning, Mayan, &

Toth, 2014). Cultural continuity was measured by traditional tribal language knowledge (Oster et al., 2014).

Healthcare providers understood that AI/ANs attach their own meaning of health and illness to their culture, values, and context (Bennett, 2010; Yurkovich, Hopkins, & Rieke, 2012). Novins et al. (2011) found AI/AN experts were disgruntled when forced to use evidence-based treatments not adapted to their culture. Both health and mental conditions worsened among Indigenous cultures by applying theories, measures, and evidence-based programs not considering their expression, diversity, and contexts (Trickett et al., 2011). On the other hand, King (2011) reported that when an innovative cultural intervention was suggested in meetings a question arose as to what it had to do with mental illness. However, cultural oriented therapy worsened deep psychological wounding treated by nonprofessional Indigenous healers that preferred to reinforce historical and contemporary trauma instead of healing the individual (Linklater, 2014). The necessity for adults with diabetes or prediabetes included clinical nutrition therapy as part of their diabetes healthcare and was part of ADA's standards of care (Evert et al., 2019).

Summary and Conclusions

The highest rate of diagnosed diabetes among all ethnic groups in the USA are AI/ANs (15.9%). Diabetes among AI/ANs was 2.3 times higher than Whites in the United States. In addition, historical trauma (outcome of colonization) was intergenerationally transmitted and linked to contemporary trauma (stressful life events and microaggressions) among AI/ANs. By examining the relationships between these

variables among AI/AN women, culturally-oriented information was produced for research and healthcare organizations. Healthcare providers lacked knowledge regarding culturally-oriented self-management education and a need of psychology treatment to build resilience for AI/AN women with T2DM who experienced historical and contemporary trauma. The ADA standards of care included individualized nutrition therapy be considered by the diabetes healthcare team to understand patients' goals to improve and maintain glycemic targets, achieve weight management goals, and attend to cardiovascular risk factors. This study filled the gap and provided information to enhance treatment for T2DM and self-management that incorporated psychological and cultural knowledge for AI/AN women.

In Chapter 3, I provide information on the quantitative study, the sample population, discuss measurement instruments, and provide details of the research methodology. In addition, I discuss the data analysis plan. I include potential threats to external, internal, and construct validity. Furthermore, I discuss ethical issues and the prevention of ethical conflicts.

Chapter 3: Research Method

The purpose of this study was to examine the relationship between historical trauma, contemporary trauma, and T2DM self-management among AI/AN women. This chapter explains the research design, sample and sampling procedures, instrumentation, data collection, and statistical analysis.

Research Design and Rationale

In this research, I employed a quantitative cross-sectional study, with a nonexperimental correlation design, and used a multiple regression analysis to assess the comparative strength of historical losses, historical loss associated symptoms (anxiety/depression and anger/avoidance subscale scores, and total symptoms score), microaggressions (microinsults and microinvalidations subscale scores, and total microaggressions score), and stressful life events in predicting the criterion variables of T2DM self-management (glucose management, dietary control, physical activity, and healthcare-use subscales, and total self-management score). This correlational design allowed me to study the relationship between naturally occurring variables that represent a sample at a given point in time (see Field, 2013). I used standard multiple regression to test the research questions and hypotheses.

In this study, the dependent variable was T2DM self-management among AI/AN women. The first independent variable was historical trauma, consisting of historical loss and historical loss associated symptoms. The second independent variable was contemporary trauma, comprised of stressful life events and microaggressions that included microinsults and microinvalidations. As cross-sectional designs are

methodologically limited, a statistical analysis was required to ascertain a pattern of relationships between variables (see Frank-Nachmias & Nachmias, 2008).

In a correlational study, the researcher observes natural phenomenon in a short period (Field, 2013). Another aspect of correlation research is seen when consistent events appeared concurrently and how they were related (see Simon, 2010). The research questions and hypotheses were analyzed by conducting five standard multiple regression analyses to estimate the relative strength of the predictors or independent variables on the scores of the dependent variables (glucose management, dietary control, physical activity, and healthcare-use subscales, and total self-management score). The interval level scale of measurement was used to assess the exact and constant distance between fixed and equal units observed in each predictor and criterion variable (see Frankfort-Nachmias & Nachmias, 2008). The variables in this study and how they are measured are shown in Table 1.

Table 1: *Criterion and Predictor Variables*

Criterion and Predictor Variables	Scale of Measurement	Instrument	Total Score or Subscale Score
T2DM Self-Management (criterion variable)	Interval	Diabetes Self-Management Questionnaire	1) Total Score for Diabetes Self-Management Questionnaire and Subscale Scores for 2) glucose management, 3) dietary control, 4) physical activity, and 5) healthcare.
Historical Loss (predictor variable)	Interval	Historical Loss Scale	1) Total Score for Historical Loss
Historical Loss Associated Symptoms (predictor variable)	Interval	Historical Loss Associated Symptoms Scale	2) Total Score for Historical Loss Associated Symptoms and Subscale Scores for 3) anxiety/depression and 4) anger/avoidance
Stressful Life Events (predictor variable)	Interval	Stressful Life Events Screening Questionnaire	5) Total Score for Stressful Life Events
Microaggressions as Microinsults and Microinvalidations (predictor variable)	Interval	Daily Racial Microaggression Scale	6) Total Score for Microaggressions and Subscale Scores of 7) microinsults and 8) microinvalidations

Research Questions and Hypotheses

This quantitative study was designed to determine the relationship between historical loss, historical loss associated symptoms, contemporary trauma issues of microaggressions (microinsults and microinvalidations), and stressful life events. This study sought to answer the following four research questions and their respective hypotheses:

To Research Question 1: To what extent does historical loss, as measured by the Historical Loss Scale (HLS) total score, relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, healthcare-use subscale scores, and total self-management score)?

$H_0$1: Historical loss is not a significant predictor of T2DM self-management.

H_a1: Historical loss is a significant predictor of T2DM self-management.

Research Question 2: To what extent do historical loss associated symptoms, as measured by the Historical Loss Associated Symptoms Scale (HLASS; (anxiety/depression and anger/avoidance subscale scores, and total score), relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

$H_0$2: Historical loss associated symptoms are not significant predictors of T2DM self-management.

H_a2: Historical loss associated symptoms are significant predictors of T2DM self-management.

Research Question 3: To what extent do stressful life events, as measured by the Stressful Life Events Screening Questionnaire (SLESQ) total score, relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

H_03: Stressful life events are not a significant predictor of T2DM self-management.

H_a3: Stressful life events are a significant predictor of T2DM self-management.

Research Question 4: To what extent do microaggressions, as measured by the Daily Racial Microaggressions Scale (DRMS; microinsults and microinvalidations subscale scores, and total microaggression score), relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

H_04: Microaggressions are not a significant predictor of T2DM self-management.

H_a4: Microaggressions are a significant predictor of T2DM self-management.

Methodology

Population

The target population for this study included AI/AN women. This specific population was selected because women have the highest incidence of T2DM diabetes

(IDF, 2017). In term of culture and ethnicity, AI/AN populations had highest incidence of T2DM (Booth et al., 2017; Schulz & Chaudhari, 2015). In addition, within AI/AN populations, women were more susceptible and had the highest incidence of T2DM (Booth et al., 2017; Schulz & Chaudhari, 2015).

The criteria to select participants (AI/AN women) for this study included: (a) 18 years and older; (b) registered at tribal health centers in Southwestern United States; (c) diagnosed with T2DM for at least 1 year; and (d) AI/AN race. The Navajo Tribes are the largest (332,129 members) in the United States and reside in Utah, Arizona, and New Mexico (Census.gov, 2010; Dubois, 2015). Diabetes prevalence (47,581) among Navajo adults over 20 years is 22.9%, and is greater than 40% for adults 40 years and older (Dubois, 2015; Ibis, 2019). When compared to 9.4% of the total diabetes rate in the United States, diabetes is an epidemic in Southwestern United States (CDC, 2017a; Dubois, 2015). In the Northern Plains, diabetes prevalence was about 16% and among Alaskan Regions about 76% (Hutchinson & Shin, 2014). Limiting the data collection process to only AI/AN women with T2DM controlled for gender and diabetes type in the Southwestern United States. Women (199 million) have highest incidence of T2DM diabetes and this incidence rate is estimated to rise to 313 million by 2040 (IDF, 2017). More importantly, diabetes is higher among AI/AN women compared to other races (Booth et al., 2017; CDC, 2017b; Schulz & Chaudhari, 2015).

AI/AN women participants registered at a health center in Southwestern United States. Participants were invited to read the informed consent form and then completed the five questionnaires. Participants retained the consent form for their records. The five

questionnaires included: Diabetes Self-Management Questionnaire (DSMQ; Appendix A); Historical Loss Scale (HLS; Appendix B); Historical Loss Associated Symptoms Scale (HLASS; Appendix C); Stressful Life Events Screening Questionnaire (SLESQ; Appendix D); and the Daily Racial Microaggressions Scale (DRMS; Appendix E). Once the questionnaires were completed the participants handed them directly back to the me. The completed questionnaires were filed in a safety-box for privacy and confidentiality before data input in SPSS 25.0 for statistical analysis.

Sampling and Sampling Procedures

The G*Power 3.0 software (Faul, Erdfelder, Lang, & Buchner, 2007) was used to calculate the sample size for the research. The power analysis required statistical variables: an alpha level, number of predictors, anticipated effect size, and desired statistical power (Faul, Erdfelder, Lang, & Buchner, 2007). In my study, the statistical variables included the following: an alpha level of 0.01, eight (8) predictor variables, an anticipated effect size of a medium size of 0.15, and a statistical power of 0.95 (Miles & Sheylin, 2007). In the literature available, an effect size of small to medium was reported (Proeschold-Bell & LeGrand, 2012; Wells, 2012; Wells, 2013). I used an alpha level of 0.01 which was a more conservative alpha level since I conducted five multiple regression analyses (Ellis, 2010).

The power analysis resulted in a recommended sample size of 206 participants. According to Tabachnick and Fidell (2007), when using standard multiple regression, it was better to have 20 times more participants than variables. Tabachnick and Fidell (2007) suggested that power might be unacceptably low no matter what the participant-

to-variable ratio was if there are fewer than 100 cases. A rule for multiple regression was that the minimum requirement was at least five times more cases than variables (Tabachnick & Fidell, 2007). If the desired sample size was not achieved, it would be necessary for the number of predictor variables to be reduced by sorting several of the subscale scores into total scores (Tabachnick & Fidell, 2007).

Procedures for Recruitment, Participation, and Data Collection

Initially, I displayed posters in AI/AN a health center in Southwestern United States advertising the need for AI/AN women with T2DM who are aged 18 years and older. A copy of the consent form was given to participants to inform them that if they felt they understood the study they made a decision about participating and indicated their consent by returning the five completed questionnaires. The consent form explained the research study to individuals and their rights stipulated in the American Psychological Association (2017) code of ethics, Principle E. The individuals' rights consider privacy, confidentiality, and self-determination especially respecting cultural, individual, and role differences at all levels (Bersoff, 2008). The informed consent to participate in research included sample questions from the questionnaires, and also informed participants that they were free to withdraw their consent and end participation at any time. The "implied" consent form required no signature from participants or personal details for participants privacy and protection. Once the five questionnaires were completed an envelope containing a gift of $20.00 was given to participants for their help.

Protocol for Indian Health Services Institute Review Board

The following information was an outline of what was required by Indian Health Services [IHS], (2017a) for the IHS IRB process. Under the Health and Human Services regulation 45 CFR 46 and the Belmont Report, AI/ANs are considered a vulnerable population (US Department of Health Human Services [HHS], 2017c). Hence, using a sample population to conduct research at health centers in Southwestern United States must be approved by IHS' Institutional Review Board [IRB], (2017a) as these sites are part of the IHS Federal-Wide Assurance (FWA) #00008894 (HHS, 2017). The FWA is the IHS Director's assurance to the Department of Health and Human Services (DHHS) Office for Human Research Protections (OHRP) that all research conducted would follow 45 CFR 46 requirements (U.S. Department of HHS, 2017). The Southwestern United States falls under the jurisdiction of the Phoenix Area, Arizona IHS IRB and documentation was be forwarded to the Director, Office of Health Programs at the Phoenix Area Indian Health Services.

The Phoenix Area IRB meets monthly. All completed protocol packets needed to be submitted no later than 2 weeks before meetings to allow enough time for review by committee members. Incomplete protocol requirements would not be reviewed.

I submitted the complete required protocol with an original application to the Phoenix, Arizona IRB. Evidence of support from the facility's Chief Executive Officer (CEO) or Tribal Council was also provided, to document that the project would not use IHS resources in a manner that adversely impacted the healthcare provided at the facility. Any presentations or publications based on the research was also approved by the IHS

IRB(s) and must be approved by the Publications Review Committee (PRC), or the IRB(s) that reviewed and approved the research study. Some IHS areas have a PRC but do not staff and operate a full IRB. Manuscripts submitted for publication contained findings of specific Tribes, even if the Tribes are not named in the manuscript, must be accompanied by approval from the relevant Tribal government(s). The IHS requirement process continued with instructions for submission to the IRB chair or administrator for the area of study. This information was copied and pasted for accurate direction of the process and summarized; once more information was required from the appropriate AI/AN health center.

I planned to collect information for nonclinical purposes from groups of AI/AN diabetes patients and reviewed their protocol with the Phoenix Area IRB Chair and determined whether the proposed activities were considered research or whether the proposed activities were not covered by 45 CFR 46. Activities not covered may include quality assurance projects or public health surveillance activities. Such nonresearch activities, however, may still fall under the privacy requirements of the Health Insurance Portability and Accountability Act (HIPAA), Privacy Act, or required other approvals.

Walden University Institutional Review Board

The Institutional Review Board (IRB) consisted of staff and faculty members from each of Walden University's major research areas and was responsible for ensuring that all Walden University research complied with the university’s ethical standards as well as U.S. Federal regulations and any applicable international guidelines. IRB

approval indicated the institution's official assessment that the potential risks of the study are outweighed by the potential benefits.

Instrumentation and Operationalization of Constructs

Participants were invited to complete the five questionnaires, were given implied consent forms, and completed the instruments on the health center's premises. The questionnaires were numbered in the order they should be completed:

1. the Diabetes Self-Management Questionnaire (DSMQ; Schmitt et al., 2013),
2. the Historical Loss Scale (HLS; Whitbeck et al., 2004),
3. the Historical Associated Symptom Scale (HLASS; Whitbeck et al., 2004),
4. the Stressful Life Events Screening Questionnaire (SLESQ; Goodman et al., 1998), and
5. the Daily Racial Microaggressions Scale (DRMS; short form; Jones & Galliher, 2015).

All the above instruments were available for public use.

Diabetes Self-Management Questionnaire

The DSMQ (see Appendix A) is a 16-item instrument designed by Schmitt et al. (2013) to assess diabetes self-care activities and predicted blood glucose control. The scale questions areas such as diet, medication, blood glucose monitoring, physical activity, and communication with healthcare professionals with the intent to determine glycemic control activities (Schmitt et al., 2013). The 16-item scale consisted of a total self-management score and four subscale scores: Glucose management (GM), dietary control (DC), physical activity (PA), and healthcare-use (HU). The DSMQ was a reliable

and valid instrument and allowed an efficient assessment of self-management of glucose levels (Schmitt et al., 2013). The DSMQ demonstrated a mean item-total correlation of 0.46 ± 0.12, and a mean correlation with HbAlc of -0.23 ± 0.09. Overall internal consistency (Cronbach's alpha) was good (0.84), and consistencies of the subscales were acceptable (GM: 0.77; DC: 0.77; PA: 0.76; HU: 0.60; Schmitt et al., 2013). The mean inter-item-correlation for T2DM patients was 0.20 (*SD*=0.17), the mean item-subscale-correlation was 0.50 (*SD*=12), and the mean item total correlation was 0.40 (*SD*=0.16).

Schmitt et al. (2013) recommended the DSMQ as a reliable and valid instrument to assess self-care and a valuable tool for scientific analyses and clinical use for diabetes. Schmitt et al. (2016) used the DSMQ to analyze the amount of variation explained in HbAlc and compared that with another model called the Summary of Diabetes Self-Care Activities (SDSCA) measure. The SDSCA was commonly used as a self-management tool but it has problems measuring depression in diabetes (Schmitt et al., 2013). The predictive power to measure glycemic control was significantly higher for the DSMQ and is the preferred tool to analyze self-reported behavioral issues associated with diabetes (Schmitt et al., 2016). Permission to use the DSMQ (see Appendix F) was given to me by Dr. Schmitt, lead author of the study.

Historical Loss Scale

The HLS (see Appendix B) is a 12-item instrument developed to measure how often thoughts pertaining to historical loss occur (Whitbeck et al., 2004). Some types of historical loss included in this instrument are loss of land, language, culture, spiritual traditions, family and family ties (Deloria, 2003; Whitbeck et al., 2004). In addition, loss

of self-respect, loss of trust, loss of people through early death, and loss of children's respect for elders and traditional ways were part of the historical loss (Whitbeck et al., 2004). The instructions to complete the HLS adult form were as follows: "Our people have experienced many losses since we came into contact with Europeans (Whites). I will read you types of losses that people have mentioned to us, and I would like you to tell how often you think of these. The types of losses are listed from 1 to 12 below and I would like you to indicate how often do you think of the losses by responding to the questions." Participants rated each item according to how often losses come to mind using a 6-point Likert scale ranging from 1=*several times a day* to, 2=*daily*, 3=*weekly*, 4=*monthly*, 5=*yearly or at special times*, and 6=*never* (Whitbeck et al., 2004).

The total score of the responses included the higher scores that indicated greater frequency of thoughts about historical loss while lower scores suggested fewer thoughts about historical loss. Included are "loss of our land," "loss of our language," "loss of our family ties because of boarding/residential schools," and two additional items for the adult version (i.e., "loss of respect by our children and grandchildren for elders" and "loss of respect by our children for traditional ways"; Walls, Whitbeck, & Armenta, 2016). Normative samples included adults from two reservations in the upper Midwest section of the United States and two reservations in Ontario, Canada, ranged in age from 28 to 59, a mean age of 38.2 for females and 41.7 for males (Whitbeck et al., 2004).

The HLS had good convergent validity as demonstrated by statistically significant correlations between the total HLS score and the anxiety/depression and anger/avoidance subscales of the Historical Loss Associated Symptoms Scale (Whitbeck et al., 2004). The

structural coefficient related historical loss with anxiety/depression was significant (β=.19) as was the coefficient with anger/avoidance (β=.31; Whitbeck et al., 2004). These results showed that the greater the perception of historical loss, the higher levels of symptoms of depression and anger were reported (Whitbeck et al., 2004). The Historical Loss Scale had a Cronbach's alpha of .92 for the total perceived loss score (Whitbeck et al., 2004).

Dorton (2007) used the HLS in a study that included 269 male and female Native Americans with a mean age of 43.03 and reported a Cronbach's alpha of .92 for the total score. Rink et al. (2012) used the HLS to study American Indian men between the ages of 18 and 24 years who resided in Fort Peck Reservation and members of the Assiniboine or Sioux Tribes. The participants were located in the High Plains prairie area of northeastern Montana, south of the border of Canada, Big Muddy Creek to the east, the Missouri River to the south, and Big Porcupine Creek to the west (Rink et al., 2012). Rink et al. (2012) researched pregnancy prevention among American Indian (men affiliated with 21 tribal groups) and the role of mental health and intention to use birth control and reported a Cronbach's alpha of .91 for the HLS total scores. Tucker et al. (2016) recruited 123 (40 males, 83 females) self-identified American Indian college students ranging in age from 18 to 25, (mean age of 19.56 years). Cronbach's alpha indicated strong internal consistency for the HLS in this sample (α=.95).

The HLS was originally developed with qualitative feedback from American Indian elders residing on reservations in the Northern Midwestern United States (Walls & Whitbeck, 2012; Walls et al., 2017). The scale was also used in research with an Urban

Koori population in Australia, with intertribal participants across the USA, a northeastern US tribal community, and work with two-spirited (homosexual) individuals living in metropolitan areas across the USA (Walls & Whitbeck, 2012). Minimal modifications were made to the HLS even after some reports of qualitative measures developed in other communities (Walls & Whitbeck, 2012). However, the original HLS only measured adult Indigenous experience with colonization (Whitbeck et al, 2004). Armenta, Whitbeck, and Habecker (2016) effectively developed the HLS in a longitudinal study specifically for Indigenous adolescents. No development of the HLS for AI/AN women (specifically) was found in the literature. Permission to use the HLS was given to me by Dr. Whitbeck (see Appendix G).

Historical Loss Associated Symptoms Scale

The original HLASS (see Appendix C) was the second part of the two historical trauma approaches that assessed constructs related to historical trauma among indigenous people (Whitbeck et al., 2004). The HLASS is a 17-item measure of frequencies of certain emotions experienced by AI/AN people after thoughts of or being reminded of historical loss (Whitbeck et al., 2004). Participants rate the frequency of each emotion or symptom experienced on a 5-point Likert scale (1=*never*, 2=*seldom*, 3=*sometimes*, 4=*often*, 5=*always*; Whitbeck et al., 2004). Examples of items include: "often feel sadness or depression," "often feel anger," "often anxiety or nervousness," "uncomfortable around White people when you think of these losses," "shame when you think of these losses," "loss of concentration," "feel isolated or distant from other people when you think of these losses," "loss of sleep," "rage," "fearful or distrust the intentions

of white people," "feel like it is happening again," "feel like avoiding places or people that remind you of these losses" (Whitbeck et al., 2004).

The purpose of the scale was to identify emotions provoked by historical loss or thoughts of historical loss (Whitbeck et al., 2004). The HLASS consisted of two subscale scores: (a) five items which measured anxiety/depression, and (b) seven items which measured anger/avoidance (Whitbeck et al., 2004). An additional five question were omitted because of low factor loading in exploratory factor analysis, however, they were included in this study (Whitbeck et al., 2004). Good convergent validity was reported for the anxiety/depression and anger/avoidance subscale scores of the HLASS (Whitbeck et al., 2004). Structural coefficients relating historical loss to anger/avoidance was statistically significant (β=.31) and the association of historical loss with anxiety/depression (β=.19; Whitbeck et al., 2004). For both of the historical loss associated symptom subscale scores, the greater the perception of historical loss, the higher levels of symptoms of depression and anger (Whitbeck et al., 2004). The two latent symptom constructs, anger/avoidance and anxiety/depression, were also significantly correlated (γ=.2; Whitbeck et al., 2004). Permission to use the HLASS was sent to me via email by Dr. Whitbeck (see Appendix G).

Stressful Life Events Screening Questionnaire – Revised

The SLESQ (see Appendix D) is a 15-item measure that assesses lifetime exposure to a variety of traumatic events related to Criterion A1 events (Goodman et al., 1998). However, there are two additional questions (14 and 15) at the end of the questionnaire. Question 14 encouraged responses to more than one event, and question

15, “As you filled out this questionnaire, did you report the same incident, or ongoing situation, under more than one item?” The purpose of the SLESQ was to distinguish efficiently a traumatic event conceptualized as “traumatic” (based on Criterion Al of the PTSD diagnoses in the DSM-IV; American Psychiatric Association [APA], 2013) and provided a total score by summing items according to Criterion-A thresholds (Beasely et al., 2003; Goodman et al., 1998; Green et al., 2007). The Criterion A1 traumatic event was defined as "involves actual or threatened death or serious injury, or a threat to the physical integrity of self or others" (APA, 2013). The SLESQ was a behavioral specific assessment of traumatic events of an interpersonal nature not based on disasters (Beasely et al., 2003; Goodman et al., 1998; Green et al., 2007).

The SLESQ included questions such as, "Were you ever in a life-threatening accident? Was physical force or a weapon ever used against you in a robbery or mugging?” To further assess the stressful life events the next question in the questionnaire was, "Were you hospitalized overnight? Was your life in danger?” Behavioral questions regarding sexual assault excluded the ambivalence of the term ‘rape’ (Goodman et al., 1998).

The test-retest correlation for the number of events reported was $r = .89$ (Goodman et al., 1998). The Cohen’s kappa coefficient measures inter-rater agreement for items and explained interrelationships (Cohen et al., 2003). The individual-item kappas for test-retest reliability of the questionnaire given two weeks apart ranged from .31 to 1.00, with a median kappa of .73 (Goodman et al., 1998). Convergent validity was assessed as adequate with a longer interview when compared to the initial self-report

(Goodman et al., 1998). In the first response, 85% of the events were classified as meeting Criterion A1 of PTSD and showed good specificity for the targeted events (Goodman et al., 1998). The correlation between the total number of events self-reported compared to the interview was significant, with $r = .77$ (Goodman et al., 1998). Item kappas for validity ranged from .26 to .90 with a median kappa of .64. For this study the AI/AN women completed the SLESQ in their home environment and were not screened or interviewed. Dr. Goodman sent an email to me granting permission to use the scale (see Appendix H).

Daily Racial Microaggressions Scale – Short Form

Jones and Galliher (2015) developed the DRMS (see short form; Appendix E) from the Inventory of Microaggressions Against Black Individuals (IMABI) to measure an AI/AN sample population. The DRMS short form provides a total microaggression score and two subscale scores for microinsults (8 items) and microinvalidations (6 items; Jones & Galliher, 2015). The items are scored on a Likert-type scale ranging from 0 to 5 with the following meanings: 1-*Never happened to me*; 2–*Happened to me, but I was not upset*; 3–*Happened to me and I was slightly upset*; 4–*Happened to me and I was moderately upset*; 5–*Happened to me and I was extremely upset*. The 14 questions or statements in the DRMS include items such as "I was made to feel as if the cultural values of another race/ethnic group were better than my own" and "someone made a statement to me that they are not racist or prejudiced because they have friends from different racial/ethnic backgrounds."

The development of the IMABI scale significantly contributed to the development of the DRMS. In the development process of IMABI a latent hierarchical regression analyses predicted correlations of IMABI with the following measures: the BSI (Brief Symptom Inventory) Global Severity Index (r = .30, p< .001), and IRRS (Index of Race-Related Stress; r = .84, p< .001) with the perceived stress of IMABI (r = .38, p<. 001). Thus, Mercer et al. (2011) reported the IMABI was a valid measure of microinsults and microinvalidations especially to measure microaggressions in Black individuals.

Preliminary evidence supports the validity of the IMABI and its purpose to develop a quantitative measure of racial microaggressions not found in existing instruments (Mercer et al., 2011). The IMABI concentrated more on microinvalidations particularly relevant in understanding the life experiences, stressors, and emotional adjustment of Black individuals (Mercer et al., 2011). The IMABI's concurrent validity was explored using correlations with variables such as social desirability, ethnic identity, racial identity, and psychological adjustment (Mercer et al., 2011). The IMABI correlated with measures of race-related stress but were more related to global perceptions of life stress and emotional distress in spite of IRRS and social desirability scores (Mercer et al., 2011). The correlation between the IMABI and the IRRS was not unexpected although the IMABI seemed unidimensional even with the inclusion of microinvalidation themes not assessed in other measures of race-related stress (Mercer et al., 2011). The DRMS specifically included microinvalidations that are harmful toward people of color and also explains prejudicial behavior and attitudes in White people (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Sue et al., 2007). Jones and Galliher (2015) adapted the

DRMS from IMABI to address microaggression issues experienced by AI/AN individuals.

In the Jones and Galliher (2015) study, 98% AI/AN female participants were targets of daily racial microaggressions, within a range of 1-5, with a median of 2.54, and a standard deviation of 0.84 (Jones & Galliher, 2015). Ninety-seven percent AI/AN male participants were targets of daily racial microaggressions ranging from 1-5, with a total median of 2.34, and a standard deviation of 0.83 (Jones & Galliher, 2015). When microinvalidations and microinsults were compared for AI/AN males and females, more females were affected by microinvalidations (Jones & Galliher, 2015). The results of the development and initial validation of the IMABI study substantiates the DRMS as a valid measure for microaggressions among AI/ANs in work, school, and community environments (Jones & Galliher, 2015; Mercer et al., 2011). Dr. Mercer gave me permission to use the DRMS (see short form; Appendix I).

Data Analysis Plan

The research questions and hypotheses evaluated the relationship between historical loss, historical loss associated symptoms, anxiety/depression, anger/avoidance, stressful life events, microinsults, microinvalidations, and T2DM self-management among AI/AN women. Before the main analysis, assumptions for multiple regression was conducted. The multiple regression analysis was used to establish if the measures of historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance subscale scores, and total symptoms score), stressful life events;

microaggressions (microinsults and microinvalidations subscale scores, and total microaggressions score) predicted T2DM self-management outcomes.

I included tests to validate the assumptions of multiple regression. Analyses was conducted to test: the linear relationship between variables, normality, multicollinearity, lack auto-correlation, and homoscedasticity. Linearity was conducted using a scatterplot in the Statistical Package for the Social Sciences (SPSS) 24.0 program. Normality was established using Q-Q plots. Multicollinearity diagnostics was determined in SPSS to ensure that the independent variables were independent of one another. A Durbin-Watson's *d* test was conducted to demonstrate no auto-correlation. Lastly, a standardized residual plot was conducted to establish homoscedasticity. These screening analyses was performed prior to analysis and was established to find if the data met the assumptions for multiple regression.

The data was analyzed using the SPSS 25.0 software used for quantitative statistical analysis. Internal consistency was evaluated using Cronbach's coefficient alpha for the five instruments (HLS, HLASS, DRMS short form, SLESQ revised, and the Diabetes Self-Management measure). Multiple regression was used to establish the relative strength of each predictor variable (historical loss, historical loss associated symptoms, stressful life events, and microaggressions (microinsults and microinvalidations) with the criterion variable of T2DM self-management. There were five standard multiple regression analyses performed for the entire data set to test the research questions and hypotheses.

Threats to Validity

Creswell (2009) stipulated that there are many internal and external factors that threaten validity. External validity was the generalizability of the findings in a study that are beyond the sample population (Creswell, 2014). My convenience sample of AI/AN women with T2DM were registered at the health center in Southwestern United States (Creswell, 2014; Stadtlander, 2015). The sample in this study was used to examine the relationship between the variables and to eliminate possible selection bias (Cook & Campbell, 1979).

The sample population was invited to participate in this study from a familiar environment in a health center in Southwestern United States where they were registered and regularly attend. They had opportunity to complete the five questionnaires in a given area at the health center. In my study, external validity may have been threatened by reactive arrangement because I do not know how long the AI/AN women took to complete questionnaires in time for them to return home or to their various obligations that could have reduced external validity (Frankfort-Nachmias & Nachmias, 2008).

Internal validity is the estimated truth about inferences shown in a causal relationship (Trochim, 2006). Some internal validity threats took place in this study. For instance, the SLESQ (Appendix D) was not a screening/interview tool, but rather a self-reported questionnaire for individuals to complete. One intrinsic factor that was unknown and could present a threat to internal validity might be the attitude of health centers' employees' influence or discouragement to participate in the study due to historical trauma factors.

The structural side of construct validity was the consistency of the instrument with behaviors of the AI/AN related to T2DM self-management. Some researchers have found that the lack of recognition of AI/AN cultural differences resulted in ineffective treatment (Dickerson et al., 2020; Kirmayer, 2012; Mohatt et al., 2011; Mullany et al., 2013; Walls et al., 2017; Whitbeck et al., 2004: Whitesell et al., 2015). Knowledge of the diversity and worldviews of AI/AN communities by doctors and researchers would have a positive impact on health research (Walls et al., 2017).

Measurement strategies in AI/AN research should be scientifically and culturally sound to produce reliable and valid data for a positive impact to reduce and prevent barriers to T2DM self-management (Walls et al., 2017). For instance, researchers found AI/ANs' traditional values were higher with proximity to reservations and that researchers studying this sample should specifically target the sample population intended for higher confidence generalizability (Armenta et al., 2016). The data collected from the women at the health center in Southwestern United States could be generalizable and valid for the many AI/AN tribal individuals' needs.

Ethical Procedures

The office of jurisdiction in Phoenix, Arizona provided Walden University approval for the research and required a copy of the approved proposal and various other protocols before ongoing permission would be granted to advertise, invite, or collect data from AI/AN women with T2DM at the health center in Southwestern United States. I was bound by the stipulations from IHS in Phoenix, Arizona. I adhered to APA, Walden IRB,

and IHS IRB guidelines for ethical protections in the treatment of the human participants in my study.

I included an implied consent form for participants that emphasized their ability to withdraw from participation at any time, without repercussions. Minimal risk to the participants was expected in completion of the surveys, and few discomforts experienced when they recollected historical losses. Debriefing information was included in the consent form and the gift of $20.00 in an envelope. Debriefing information provided for respondents that experienced minor discomforts to contact counselors at the health center where they are registered.

The prospective participants were given the implied consent form to read and the five questionnaires to complete at the health center. The consent form explained the research study and included sensitive sample questions from the five questionnaires they completed if they wished to participate. The completed questionnaires indicated their willingness to participate in the research. The completed questionnaires was filed in a safety-box prior to input into SPSS 25.0 for statistical analysis.

After analysis the data would be securely stored on a dedicated external hard drive using password-protected restriction access. I updated all electronic storage media that contained the appropriate data to ensure adherence to current efficiency standards. It included virus protection updates to ensure electronic integrity of the data set. In addition, I secured the data in this location for five years.

Because an AI/AN health administrator advised me that participants would be difficult to find for the research study (40% participants responded in previous studies) a

gift of $20.00 encouraged their desire to participate. Hence, once receipt of the completed five questionnaires the participant received a thank you note with the $20.00 gift. If participants were informed that if they wanted a summary of the study the information will be available at the health center once the study was completed.

Summary

Chapter 3 provided the research design and methodology used to test hypotheses and a description of the measures. This research was a quantitative cross-sectional study using a non-experimental correlational design. Specifically, this study examined the possible relationships between historical trauma (loss and symptoms), contemporary trauma that included microaggressions (microinsults and microinvalidations) and stressful life events, and T2DM self-management among AI/AN women. SPSS 25.0 was used to evaluate data using multiple linear regression. In Chapter 4, I will report details concerning data collection efforts and analysis results from descriptive and inferential statistics using multiple regression.

Chapter 4: Results

This quantitative study aimed to understand the historical loss (as measured by the HLS), historical loss associated trauma (as measured by the HLASS), and contemporary trauma that included stressful life events (as measured by the SLEQ) and daily racial microaggressions (as measured by the DRMS) as predictors of T2DM self-management in AI/AN women. The purpose of this study was to determine the extent to which historical trauma, contemporary trauma, stressful life events, and daily racial microaggressions predicted AI/AN women's T2DM self-management. I assessed five diabetes self-management components that included glucose monitoring, dietary control, physical activity, healthcare-use, and diabetes self-management. Multiple regression analysis was used to determine the relative strength of historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance), stressful life events, and daily racial microaggressions (microinvalidations and microinsults) in predicting T2DM self-management. This quantitative nonexperimental study was conducted to assess the predictive relationships between these variables. The following research questions and hypotheses guided this study:

Research Question 1: To what extent does historical loss, as measured by the Historical Loss Scale (HLS) total score, relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, healthcare-use subscale scores, and total self-management score)?

$H_0$1: Historical loss is not a significant predictor of T2DM self-management.

H_a1: Historical loss is a significant predictor of T2DM self-management.

Research Question 2: To what extent do historical loss associated symptoms, as measured by the Historical Loss Associated Symptoms Scale (HLASS; (anxiety/depression and anger/avoidance subscale scores, and total score), relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

H_02: Historical loss associated symptoms are not significant predictors of T2DM self-management.

H_a2: Historical loss associated symptoms are significant predictors of T2DM self-management.

Research Question 3: To what extent do stressful life events, as measured by the Stressful Life Events Screening Questionnaire (SLESQ) total score, relate to T2DM Self-Management, as measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

H_03: Stressful life events are not a significant predictor of T2DM self-management.

H_a3: Stressful life events are a significant predictor of T2DM self-management.

Research Question 4: To what extent do microaggressions, as measured by the Daily Racial Microaggressions Scale (DRMS; microinsults and microinvalidations subscale scores, and total microaggression score), relate to T2DM Self-Management, as

measured by the Diabetes Self-Management Questionnaire (DSMQ; glucose management, dietary control, physical activity, and healthcare-use subscale scores, and total self-management score)?

$H_0$4: Microaggressions are not a significant predictor of T2DM self-management.

H_a4: Microaggressions are a significant predictor of T2DM self-management.

Data Collection

Data collection began on 6 July 2019 at 8:00 p.m. and ended on 27 August 2019 at 10:00 a.m. As described in Chapter 3, the data collection began after approval was given by IHS IRB and the Tribal Business Center in Southwestern United States to invite AI/AN women who attended the health center to participate, to display posters, and to hand out flyers in the buildings and general environment. An applied consent form was given to each woman to read before they participated in the study. The implied consent form required no signature from participants or personal details to protect participant's privacy. The participants retained the consent form for their personal records that included debriefing information as required by IHS IRB. The implied consent included sample questions. It also informed participants that they were free to withdraw their consent and end participation at any time. Once the five questionnaires were completed participants were given an envelope that contained a gift of $20.00.

Under the Health and Human Services regulation 45 CFR 46 and the Belmont Report, AI/ANs are considered a vulnerable population DHHS (2017c). Hence, using an AI/AN sample population to conduct research at health centers in Southwestern United States had to be approved by IHS' IRB (2017a) as these sites are part of the IHS Federal-

Wide Assurance (FWA) #00008894 (HHS, 2017). The FWA is the IHS Director's assurance to the DHHS, Office for Human Research Protections (OHRP) that all research conducted would follow 45 CFR 46 requirements (DHHS, 2017). The Southwestern United States FWA falls under the Phoenix Arizona Area IHS and the IRB documentation was forwarded to the Director, Office of Health Programs at the Phoenix Area IHS for approval.

There were 212 participants who were interested in completing the survey, but only of the 208 participants completed the survey. Two patients were mentally disabled and partially completed the surveys that were not included with the required 206 respondents. Other participants were prediabetic status. All the participants were affiliated with a Tribal group.

Results

Descriptive statistics for the sample and results of the regression analyses are presented in this section. I calculated means, standard deviations, frequencies, and percentages for the categorical variables. I conducted several multiple linear regressions with these variables and the AI/AN women with T2DM self-management perceptions of historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance), stressful life events, and microaggressions (microinsults and microinvalidations).

Descriptive Statistics

Participants responded to a screening question of Tribal affiliation and if they had T2DM for longer than one year before they were given the implied consent and

completed the five questionnaires. All participants reported that they were authentic AI/AN women with T2DM for longer than one year, they were aged 18 years and older, and registered at the IHS health center in Southwestern United States (n = 206, 100%). Participants were not asked to report demographic information because they are registered as patients at the IHS health center. The means and standard deviations for diabetes self-management scores (glucose monitoring, physical activity, dietary control, and total diabetes self-management), total historical loss, historical loss associated symptoms subscale scores (anxiety/depression and anger/avoidance), total stressful life events, and daily racial microaggression score, plus the subscales (microinsults and microinvalidations) are shown in Table 2.

Table 2: *Descriptive Statistics for Total and Subscale Scores*

Variable	*N*	Mean	*SD*
Diabetes Self Management Total Score	206	29.60	7.481
Blood Glucose Monitoring	206	11.14	3.419
Dietary Control	206	5.45	1.972
Physical Activity	206	5.42	2.157
Healthcare-use	206	7.59	2.215
Historical Loss Associated Symptoms Total Score	206	36.05	16.298
Anger/Avoidance	206	19.08	8.729
Anxiety/Depression	206	16.97	8.273
Historical loss Total Score	206	35.62	17.412
Stressful Life Events Total Score	206	19.01	3.320
Daily Racial Microaggressions Total Score	206	28.27	13.147
Microinsults	206	16.14	7.858
Microinvalidations	206	10.17	5.207

The total historical loss scale scores ranged from 0 to 72, with an average of 35.62 (*SD* = 17.412). The total historical loss associated symptoms scores ranged from 17 to 153 with an average of 36.05 (*SD* = 16.298). The historical loss associated symptoms

anxiety/depression subscale scores ranged from 8 to 72 with an average of 16.97 (*SD* = 8.273). The historical loss associated symptoms anger/avoidance subscale score ranged from 9 to 81 with an average of 19.08 (*SD* = 8.729). The total stressful life events scores ranged from 15 to 29 with an average of 19.01 (*SD* = 3.320). The total daily racial microaggressions scores ranged from 14 to 17 with an average of 28.27 (*SD* = 13.147). The daily racial microaggressions microinsults subscale scores ranged from 8 to 40 with an average of 16.14 (*SD* = 7.858). The daily racial microaggressions micoinvalidations subscale scores ranged from 0 to 24 with an average of 10.17 (*SD* = 5.207).

The total diabetes self-management scores ranged from 3 to 48 with an average of 29.60 (*SD* = 7.481). The glucose monitoring subscale scores ranged from 0 to 18 with an average of 11.14 (*SD* = 3.419). The dietary control subscale scores ranged from 0 to 9 with an average of 5.45 (*SD* = 1.972). The healthcare-use subscale scores ranged from 0 to 12 with an average of 7.59 (*SD* = 2.215). The physical activity subscale scores ranged from 0 to 9 with an average of 5.42 (*SD* = 2.157).

Evaluation of Statistical Assumptions

I assessed the assumptions of normality, homoscedasticity, and multicollinearity before the multiple linear analyses. I compared the resulting values for skewness and kurtosis to the guidelines established to ascertain the data distribution difference from a normal distribution. The critical values were ±2 for skewness and ±3 for kurtosis (Westfall & Henning, 2013). When the skewness was greater than or equal to 2 or less than or equal to -2, the variable was asymmetrical about its mean. When the kurtosis was greater than or equal to 3, then the variable's distribution was different than a normal distribution in its tendency to produce outliers. If the kurtosis was less than 3, then the dataset had lighter tails than a normal distribution (Westfall & Henning, 2013). All scores for each questionnaire were within the value of the boundaries for kurtosis and normality was found. The Shapiro-Wilk test was conducted to test for normality, and the results of the test indicated that the data distribution did not differ from a normal data distribution; therefore, the assumption of normality was met. Table 3 presents the results of the Shapiro-Wilk test for normality, skewness, and kurtosis.

Table 3: *Results of the Normality Testing for Dependent and Independent Variables*

Variable	Statistic	*df*	*p*	Skewness	Kurtosis
Diabetes Self Management Total Score	.982	206	.009	-.147	.714
Glucose Monitor	.974	206	.001	.015	-.088
Dietary Control	.966	206	.000	-.210	-.228
Physical Activity	.959	206	.000	-.195	-.320
Healthcare-use	.967	206	.000	-.422	.294
Historical Loss Associated Symptoms Total Score	.806	206	.000	2.717	14.198
Anger/Avoidance	.834	206	.000	2.399	12.342
Anxiety/Depression	.788	206	.000	2.709	12.589
Historical loss Total Score	.971	206	.000	.278	-.753
Stressful Life Events Total Score	.919	206	.000	.806	-.021
Daily Racial Microaggressions Total Score	.888	206	.000	1.139	.822
Microinsults	.884	206	.000	1.062	.558
Microinvalidations	.980	206	.004	.318	-.482

To assess homoscedasticity, I examined a residual scatterplot for the predicted versus standardized data for each of the subscales of the instruments used. The points appeared to be distributed with about a mean value of zero and there was no curvature in the plot. Therefore, the assumption of homoscedasticity was met. The following graphs (Figures 1 to 5) present the residual scatterplot for homoscedasticity for each of the independent variables.

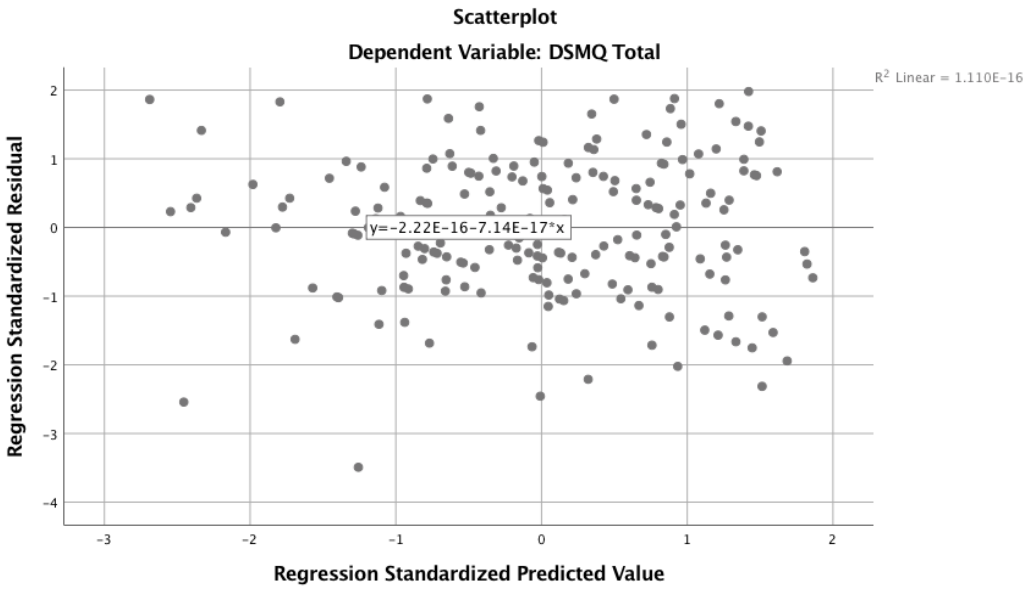

Figure 1: *Residual scatterplot for homoscedasticity for DSMQ*

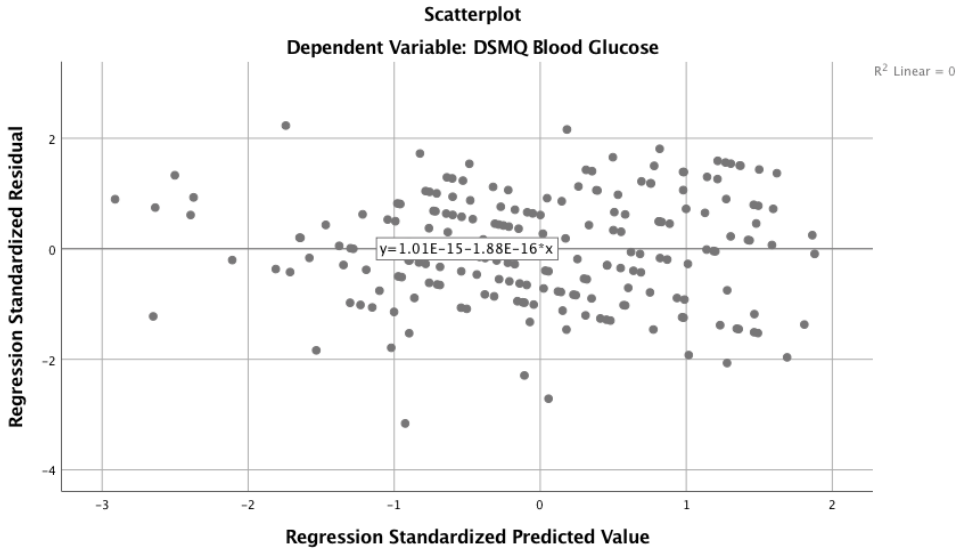

Figure 2: *Residual scatter plot for homoscedasticity for glucose monitoring*

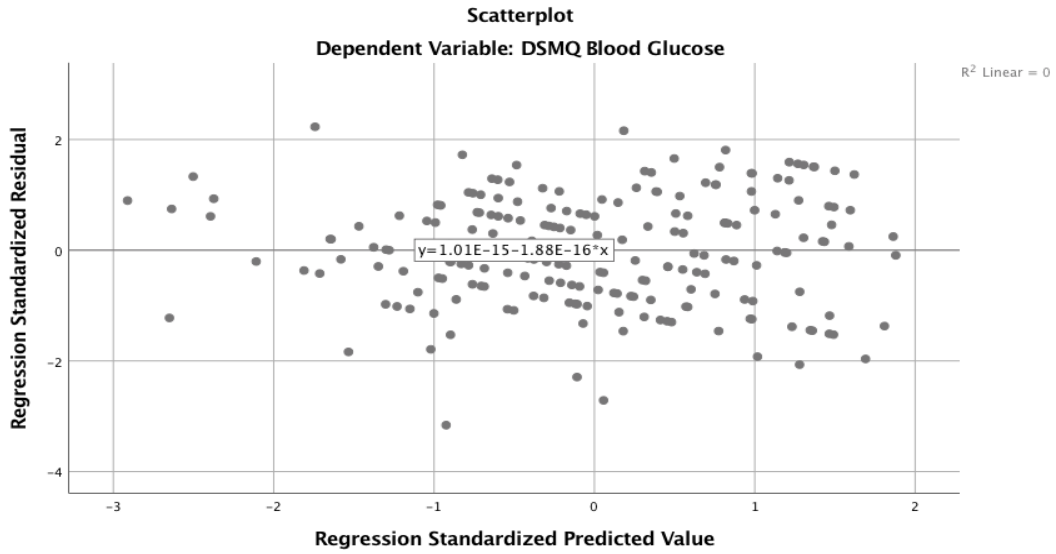

Figure 3. *Residual scatterplot for homoscedasticity dietary control*

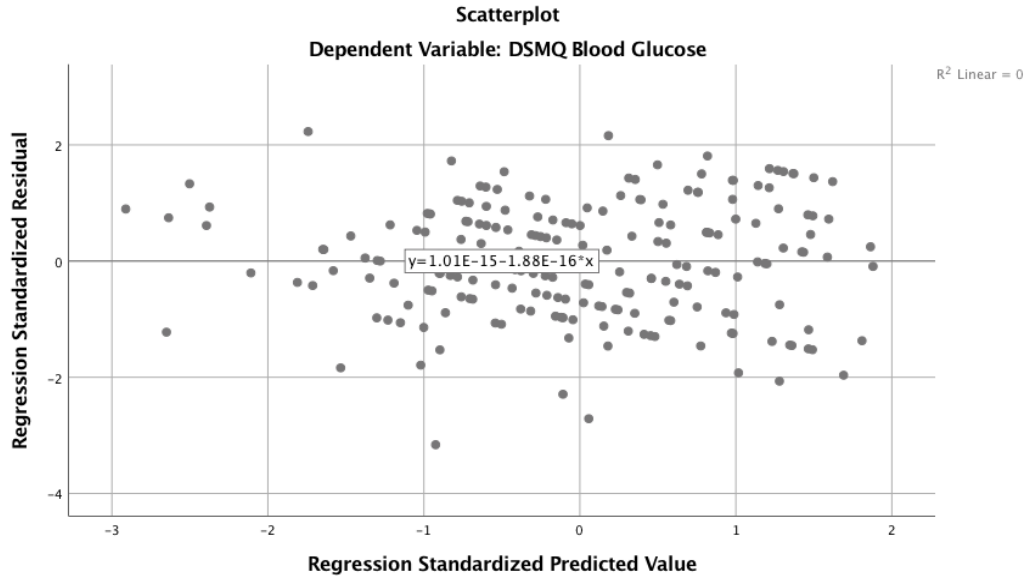

Figure 4:Residual scatterplot for homoscedasticity for healthcare-use

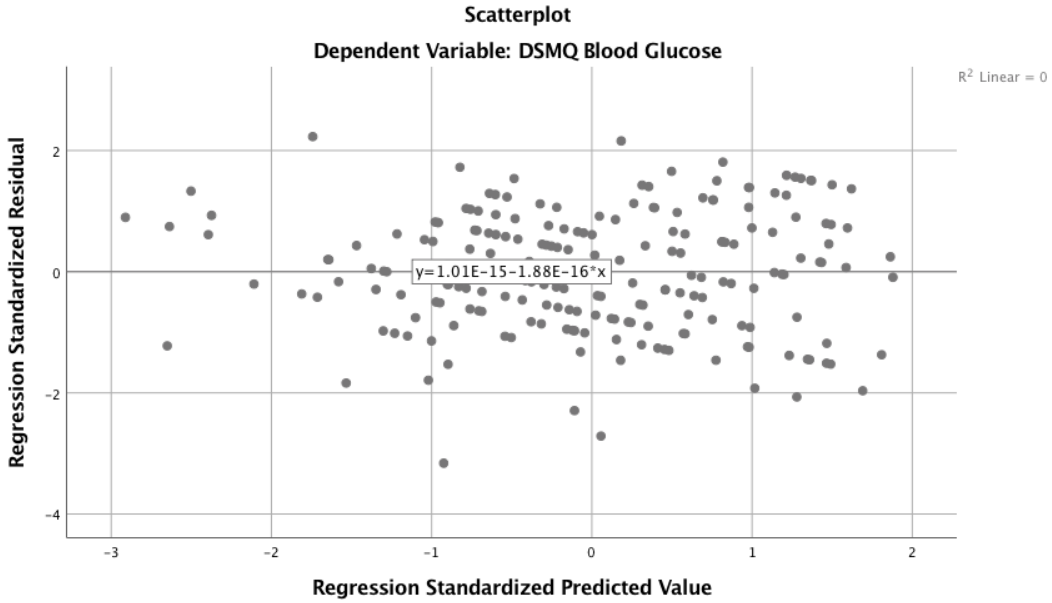

Figure 5: *Residual scatterplot for homoscedasticity for physical activity*

I calculated Cronbach's Alpha to measure for internal consistency. A reliability coefficient of .70 or higher is considered acceptable (Greg & Mallory, 2003). I calculated Cronbach's alpha for each of the following instruments: diabetes self-management (α=0.756), historical loss scale (α=0.771), historical loss associated symptoms scale (α=0.755), daily racial microaggressions scale (α=0.726), and stressful life events scale(α=0.721). I also calculated Cronbach's alpha for each of the subscales for diabetes self-management: glucose monitoring (α=0.761), dietary control (α=0.764), healthcare-use (α=0.762), and physical activity (α=0.761); the daily racial microaggressions: microinsults (α=0.715), and microinvalidations (α=0.730). I then calculated the historical loss associated symptoms subscale: anger/avoidance (α=0.756) and historical loss associated symptoms anxiety/depression (α=0.728).

Finally, I calculated Variance Inflation Factors (VIFs) for the predictor variables. VIFs reflect the amount of correlation among the predictor variables included in the analysis (Stevens, 2009). The VIFs were assessed using the standard established by Menard (2009); values greater than five indicated collinearity problems while values greater than 10 were untrustworthy and evidence of multicollinearity. The microinsults subscale score and the daily racial microaggressions total score had higher degrees of multicollinearity with VIF values of over 20 that exceeded the cut-off and therefore indicated evidence of multicollinearity. Table 4 presents the VIF values for the other predictor variables.

Table 4: *Variance Inflation Factor (VIF) Values for the Predictor Variables*

Variable	VIF
Anger and Avoidance subscale	3.475
Anxiety and Depression subscale	3.442
Historical Loss Total	1.215
Stressful Life Events Total	1.304
Daily Racial Microaggressions Total	20.382
Microinsults subscale	20.479
Microinvalidations subscale	1.060

Multiple Regression Analyses

I conducted a multiple linear regression analyses considering the research questions and used the standard entry method. The standard method permits entry of the predictor variables into the regression model simultaneously. The predictor variables associated with my research questions were HLS (total score), HLASS (total score and subscale scores for anxiety/depression and anger/avoidance), SLEQ (total score), and DRMS (total score and subscale scores for microinsults and microinvalidations). The dependent variables included diabetes self-management total score and subscale scores (blood glucose monitoring, dietary control, physical activity, and healthcare-use).

Multiple Regression: Predicting T2DM Self-Management (Total Score)

I conducted a multiple linear regression analysis to assess the relationship between the predictor variables and the T2DM self-management total score. The predictor variables for the multiple linear regression included historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance subscales), stressful life events, and daily racial microaggressions (microinsults and microinvalidations subscales). The result of the multiple linear regression was statistically significant, F (7, 198) = 18.419, $p < .05$, $R^2 = 0.394$. This finding indicated that the overall model was statistically significant. The model explained 40% of the variation in T2DM self-management total scores.

The only significant predictor of the T2DM self-management total score was the microinvalidations subscale score, $B = -.848$, $p < .05$. The results indicated that as microinvalidations scores increased, the T2DM self-management total scores decreased.

On average, for every one-unit increase in microinvalidations, there was a -.848 unit decrease in diabetes self-management. The results are shown in Table 5.

Table 5: *Results of the Multiple Linear Regression Predicting T2DM Self-Management Total Scores*

Variable	*B*	*SE*	*β*	*t*	*p*
Anger and Avoidance subscale	.067	.088	.078	.758	.449
Anxiety and Depression subscale	-.027	.093	-.030	-.288	.774
Historical Loss Total	-.039	.026	-.092	-1.503	.134
Stressful Life Events Total	-.255	.142	-.113	-1.793	.075
Daily Racial Microaggressions Total	.141	.142	.248	.992	.323
Microinsults subscale	-.282	.238	-.296	-1.183	.238
Microinvalidations subscale	-.848	.082	-.590	-10.363	.000

Note. F (7, 198) = 18.419, $p < .05$, $R^2 = 0.394$

Multiple Regression: Predicting T2DM Self-Management (Blood Glucose Monitoring Subscale Score)

I conducted another multiple linear regression analysis to assess the relationship between the predictor variables and blood glucose monitoring. The predictor variables for the multiple linear regression included historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance subscales), stressful life events, and daily racial microaggressions (microinsults and microinvalidations subscales).

The result of the multiple linear regression was statistically significant, F (7,198) =8.864, $p < .05$, $R^2 = 0.239$. This finding indicated that the overall model was statistically significant. The model explained 24% of the variance in blood glucose monitoring subscale scores.

The microinvalidations subscale score was the only significant predictor of blood glucose monitoring, $B = -.283$, $p < .05$. The results indicated that as microinvalidations scores increased, blood glucose monitoring subscale scores decreased. On average, for every one-unit increase in microinvalidations, there was a -.283 unit decrease in glucose monitoring. The multiple regression results are shown in Table 6.

Table 6: *Results of the Multiple Linear Regression Predicting Blood Glucose Monitoring*

Variable	*B*	*SE*	*β*	*t*	*p*
Anger and Avoidance subscale	.026	.045	.065	.564	.573
Anxiety and Depression subscale	-.019	.048	-.045	-.393	.695
Historical Loss Total	-.026	.013	-.132	-1.938	.054
Stressful Life Events Total	-.109	.073	-.106	-1.497	.136
Daily Racial Microaggressions Total	.037	.073	.142	.509	.611
Microinsults subscale	-.073	.122	-.167	-.594	.553
Microinvalidations subscale	-.283	.042	-.430	-6.743	.000

Note. F (7,198) = 8.864, $p < .05$, $R^2 = 0.239$

Multiple Regression: Predicting T2DM Self-Management (DSMQ Dietary Control Subscale Score)

I conducted a multiple linear regression analysis to assess the relationship between predictor variables and dietary control. The predictor variables for the multiple linear regression included historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance subscales), stressful life events, and daily racial microaggressions (microinsults and microinvalidations subscales).

The result of the multiple linear regression was statistically significant, F (7,198) = 2.267, $p < .05$, $R^2 = 0.074$. This finding indicated that the overall model was statistically significant. The model explained 7% of the variance in T2DM self-management (DSMQ dietary control subscale scores).

The stressful life events score was the only statistically significant predictor of the dietary control subscale score, $B = -.096$, $p < .05$. The results indicated that as stressful life events scores increased, dietary control subscale scores decreased. On average, for every one-unit increase in stressful life events, there was a -0.096 unit decrease in dietary control subscale scores. The multiple regression results are shown in Table 7.

Table 7: *Results of the Multiple Linear Regression Predicting Dietary Control*

Variable	B	SE	β	t	p
Anger and Avoidance subscale	-.007	.029	-.030	-.235	.814
Anxiety and Depression subscale	.038	.030	.160	1.265	.207
Historical Loss Total	-.010	.009	-.092	-1.226	.221
Stressful Life Events Total	-.096	.046	-.161	-2.064	.040
Daily Racial Microaggressions Total	.049	.046	.325	1.054	.293
Microinsults subscale	-.089	.078	-.355	-1.147	.253
Microinvalidations subscale	-.045	.027	-.119	-1.685	.094

Note. F (7,198) 2.267, $p < .05$, $R^2 = .074$

Multiple Regression: Predicting T2DM Self-Management (DSMQ Healthcare-use Subscale Score)

I conducted a multiple linear regression analysis to assess the relationship between the predictor variables and healthcare-use subscale scores. The predictor variables for the multiple linear regression included historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance subscales), stressful life events, and daily racial microaggressions (microinsults and microinvalidations subscales).

The result of the multiple linear regression was statistically significant, F (7,198) = 17.956, $p < .05$, $R^2 = 0.388$. This finding indicated that the overall model was statistically significant. The model explained 39% of the variance in healthcare-use subscale scores.

The microinvalidations subscale score was the only statistically significant predictor of healthcare-use subscale scores, $B = -.248$, $p < .05$. The results indicated that as microinvalidation scores increased, healthcare-use decreased. On average, for every one-unit increase in microinvalidations there was a -.096 unit decrease in healthcare-use subscale scores. The multiple regression results are shown in Table 8.

Table 8: *Results of the Multiple Linear Regression Predicting Healthcare-Use*

Variable	B	SE	β	t	p
Anger and Avoidance subscale	.012	.026	.049	.471	.638
Anxiety and Depression subscale	-.047	.028	-.177	-1.719	.087
Historical Loss Total	-.001	.008	-.004	-.068	.946
Stressful Life Events Total	-.048	.042	-.072	-1.129	.260
Daily Racial Microaggressions Total	.014	.042	.081	.321	.748
Microinsults subscale	-.021	.071	-.073	-.290	.772
Microinvalidations subscale	-.248	.024	-.582	-10.178	.000

Note. F (11,215) 2.688, $p < .05$, $R^2 = 0.121$

Multiple Regression: Predicting T2DM Self-Management (DSMQ Physical Activity Subscale Score)

I conducted a multiple linear regression analysis to assess the relationship between the predictor variables and physical activity subscale scores. The predictor variables for the multiple linear regression included historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance subscales), stressful life events, and daily racial microaggressions (microinsults and microinvalidations subscales).

The result of the multiple linear regression was statistically significant, F (7,198) = 21.958, $p < .05$, $R^2 = 0.437$. This finding indicated that the overall model was statistically significant. The model explained 44% of the variance in physical activity subscale scores.

The microinvalidations subscale score was the only statistically significant predictor of physical activity subscale scores, $B = -.272$, $p < .05$. The results indicated that as microinvalidation scores increased, physical activity subscale scores decreased. On average, for every one-unit increase in microinvalidations, there was a -0.272 unit decrease in physical activity subscale scores. The results are shown in Table 9.

Table 9: *Results of the Multiple Linear Regression Predicting Diabetes Self-Management Physical Activity*

Variable	B	SE	β	t	p
Anger and Avoidance subscale	.036	.025	.145	1.460	.146
Anxiety and Depression subscale	.001	.026	.005	.046	.963
Historical Loss Total	-.002	.007	-.019	-.324	.746
Stressful Life Events Total	-.002	.040	-.004	-.061	.951
Daily Racial Microaggressions Total	.041	.040	.252	1.049	.296
Microinsults subscale	-.100	.066	-.363	-1.504	.134
Microinvalidations subscale	-.272	.023	-.657	-11.974	.000

Note. F (7,198) 21.958, $p < .05$, $R^2 = 0.437$

Summary

I investigated the predictive relationship between historical loss, historical loss associated symptoms, microaggressions, stressful life events, and T2DM self-management. I conducted multiple linear regression analyses to determine if there was a statistically significant relationship between the predictor variables and criterion variables. The predictor variables included historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance), stressful life events, and microaggressions (microinsults and microinvalidations). The criterion variables included the components of T2DM self-management (blood glucose monitoring, dietary control, physical activity, and healthcare-use). Microinvalidations were a significant predictor of the total T2DM self-management scores and the subscale scores of blood glucose monitoring, dietary control, healthcare-use, and physical activity. In addition, stressful life events were a significant predictor of dietary control. In Chapter 5, an interpretation of the findings, the limitations of the study, and recommendations for future research are presented.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this nonexperimental quantitative study was to examine the relationship between historical loss, historical loss associated symptoms (anxiety/depression and anger/avoidance), stressful life events, microaggressions (microinsults and microinvalidations), and T2DM self-management (blood glucose monitoring, dietary control, physical activity, healthcare use, and total self-management) among AI/AN women. Although extensive research is available regarding the development and prevalence of T2DM among AI/ANs, T2DM self-management remains a problem among these groups (Wilkinson et al., 2014). These variables were considered because AI/ANs experience high levels of historical losses of land, language, and culture. As a result of historical trauma, AI/ANs experience various forms of contemporary trauma. In this study, contemporary trauma was assessed using measures of stress life events and microaggressions (microinsults and microinvalidations). No previous research had examined historical trauma, contemporary trauma, and self-management of T2DM among AI/AN women.

In this cross-sectional study, standard multiple regression analyses were used to determine the relationship between the predictor variables of historical trauma (historical loss, historical loss associated symptoms) and contemporary trauma (stressful life events and microaggressions) and the criterion variables of components of T2DM self-management (blood glucose monitoring, physical activity, healthcare use, dietary control, and overall self-management). The results showed that historical loss and historical loss

associated symptoms (anxiety/depression, anger/avoidance) were not significant predictors of any aspect of T2DM self-management. The variable of stressful life events was the only significant predictor of dietary control. This result demonstrated an inverse relationship between stressful life events and dietary control. That is, increases in stressful life events predicted poorer dietary control. In terms of microaggressions, the subscale of microinsults did not significantly predict any aspect of T2DM self-management. However, the subscale of microinvalidations significantly predicted glucose management, physical activity, healthcare-use, and total T2DM self-management. Microinvalidations did not significantly predict dietary control. These results demonstrated an inverse relationship between microinvalidations and T2DM self-management. That is, higher perceived levels of microinvalidations predicted poorer self-management of T2DM (i.e., less frequent blood glucose monitoring, reduced physical activity, less frequent healthcare-use, and poorer overall total T2DM self-management). Thus, the results of the study showed that variables related to contemporary trauma (stressful life events and microinvalidation) significantly predicted poorer T2DM self-management.

Interpretation of the Findings

Hypothesis 1 – Historical Loss

In Hypothesis 1, I examined whether there was a significant relationship between historical loss and T2DM self-management components. The results showed historical loss was not a significant predictor of any aspect of T2DM self-management (blood glucose management, dietary control, physical activity, healthcare-use, and total self-

management). Self-management barriers may be related to the daily situational, cultural, and social issues presented to the T2DM individual (Brave Heart et al., 2011; Brave Heart & DeBruyn, 1998; Duran, 2006; Evert et al., 2019; Jang et al., 2018; Wilkinson et al., 2013). Many patients experienced long-term stressors that prevented the management of T2DM (Novak et al., 2013; Osborn et al., 2014).

The literature defines historical trauma as experiences of loss of land, language, and culture during colonization (Gone & Trimble, 2012). The historical trauma concept includes the negative social and political incidents of the AI/ANs transmitted to current generations. The trauma is intergenerationally transmitted and may result in accumulated emotional and psychological injury or 'soul wound' to massive tribal groups (Duran, 2006; Gone & Trimble, 2012; Walls et al., 2017). The experience of the accumulated emotional and psychological injuries among AI/ANs has been associated, in previous research, with behavioral health issues such as depression, substance dependence, diabetes, dysfunctional parenting, poverty, poor housing, homelessness, lack of opportunities, and neighborhood safety on reservations (Myhra & Wieling, 2014; Roy et al., 2020).

Studies have examined the relationship between historical trauma/loss and the negative impact on health of AI/AN groups (Joe, 2016; MacDonald & Steenbeek, 2015; Schulz & Chaudhari, 2015). Historical trauma/loss contributed to changes in AI/AN traditions that directly impacted diabetes (Joe, 2016; MacDonald & Steenbeek, 2015; Schulz & Chaudhari, 2015). Historical trauma adversely affected AI/ANs and their traditions of Tribal self-government and holistic healthcare systems that consisted of

mental, physical, and spiritual care (Joe, 2016). Today, AI/ANs suffer disproportionately high levels of health disparities (including diabetes) due to associated loss of land, cultural devastation, and lack of access to healthy environments (Walter et al., 2011). A significant change was made to the AI/AN tribal traditional way of eating during colonization (historical loss) by replacing it with military rations and is now associated with the AI/AN diet (Joe, 2016; MacDonald & Steenbeek, 2015; Schulz & Chaudhari, 2015). Specifically, White settlers diverted water away from the Pima reservation that prevented farming, lack of food, and labor that changed their diet and physical activity, and diabetes was introduced (Schulz & Chaudhari, 2015). Pima Indians have the highest prevalence of T2DM on the globe (Booth et al., 2017; Spero, 2015), and live a modernized lifestyle, use technology, and eat processed foods that cause obesity and results in T2DM (Esparza-Romero et al., 2015; Hu, 2011). Researchers have found that overweight and obesity are precursors to T2DM, hypertension, and cardiovascular disease (Trude et al., 2015; Webster, 2018). Diabetes among Mexican Pima women significantly increased over a 15-year period (from 18.9% in 1995 to 36.3% in 2010). This was a result of eating available and affordable modern foods high in carbohydrates (Esparza-Romero et al., 2015; Hrdlcka,1908; Schulz & Chaudhari, 2015).

T2DM develops over time by eating poor unbalanced meals and lack of exercise (Bray, 2015; Satterfield, 2016; Gadhoke et al., 2015; Yracheta et al., 2015). These factors lead to obesity and diseases like T2DM, cancer, hypertension, cardiovascular disease, and stroke (Rosas et al., 2016; Trude et al., 2015). The highest obesity rates in the United States are among AI/ANs (23.9%) that is included in the 2.8 million Americans that

indirectly die from obesity annually or part of the 18% with diabetes (Steinfeld, 2018; Trude et al., 2015). Insulin resistance is linked to extra belly fat (central obesity or abdominal obesity), T2DM, and heart and blood vessel disease (ADA, 2017a; NIDDK, 2016; Zhu et al., 2019).

Self-perceived permanent stress has also been found to be a long-term predictor of T2DM, coronary heart disease, and stroke (Novak et al., 2013). Similarly, researchers have confirmed that continuous stressful life events contribute to T2DM and stress-related processes that affected multiple areas of the body (Steptoe et al., 2014), making individuals such as the Pima Indians more susceptible to T2DM (Baier & Hanson, 2004). AI/ANs experience long-term stress from an early age for generations that contribute to endemic T2DM and aggravate the T2DM condition (Beasely et al., 2003; Soto et al., 2015; Steptoe et al., 2013; Steptoe et al., 2014). However, in many cases, AI/AN women with T2DM exposed to historical trauma/loss effects are already vulnerable to pathological dysfunction and distress (Gone, 2013; Gone & Trimble, 2012). Thus, it was reasonable to hypothesize that the experience of historical loss might negatively impact the self-management of T2DM.

The highest rates of diagnosed diabetes in the United States are among AI/ANs (15.9%; ADA, 2017a), and the prevalence among adults is 2.3 times higher than non-Hispanic whites in the United States (Census.gov, 2018; IHS, 2016a; Nicklett et al., 2016). Researchers have also found that AI/ANs are predisposed to obesity and engage in specific behaviors that result in high levels of obesity (23.9%) compared to other ethnic groups (18.7%) in the United States (Bray, 2015; Gonzales et al., 2017; Trude et al.,

2015). Obesity is a contributing factor to diseases such as T2DM (Trude et al., 2015). Previous researchers found obesity is 40% prevalent among all AI/AN adults due to poor diet (Gadhoke et al., 2015; Yracheta et al., 2015).

Researchers have also found that the high levels of obesity and T2DM among AI/ANs may be the result of an environmental transition from traditional (historical) to modern lifestyles (Bray, 2015; Esparza-Romero et al. et al., 2015). Recent research conducted among the Pima and Maricopa communities of Maycoba reported significant changes over 15 years such as paved roads, piped drinking water, electricity, retail food chains, clothing, hotel establishments, changes in historical land usage, and modern transportation options negatively impacted AI/AN communities (Bray, 2015; Esparza-Romero et al., 2015). These researchers examined the rates of obesity and diabetes relative to Pima's 'modern' environment (Bray, 2015; Esparza-Romero et al., 2015). The results of this study indicated that obesity and diabetes increased significantly due to those environmental changes (Bray, 2015; Esparza-Romero et al., 2015).

Researchers have found AI/ANs with diabetes also experience mental health issues such as depression, alcohol dependence, and psychosocial stressors (Jiang et al., 2007). AI/ANs experience high levels of violence, abuse, and neglect and inevitably develop trauma-based mental health disorders (Garcia, 2020). AI/ANs with mental health issues resort to substance abuse, experience depression, and have diabetes that is more than 12 times higher for AI/ANs than for Whites (Aronson et al., 2016; Tann, Yahiku, Okamoto, & Yanow, 2007). Previous researchers found that individuals with diabetes and mental health problems experience diabetes-related mortality more than those without

mental health issues (Egede, Nietert, & Zheng, 2005; Wu, Hsu, & Wang, 2020; Blevins, Gonzalez, & Wagner, 2020). Similarly, AI/ANs with diabetes suffer high mortality rates due to mental health issues (Knaster, Fretts, & Phillips, 2015; Aronson, Palombi, & Walls, 2016; West et al., 2020). The American Diabetes Association (2020) recommends a person-centered, outcomes-driven treatment to assess diabetes patients with depression, diabetes-related distress, and anxiety. The need for psychotherapy among diabetes patients with mental illness is necessary for T2DM self-management (Garcia, 2020).

Many researchers have also reported that depression is directly related to poor T2DM self-management (Pouwer et al., 2020; Pouwer & Nefs, 2019; Johansen et al., 2014; Sumlin et al., 2014). Factors commonly associated with diabetes include depression, anxiety, and emotional distress and negatively impact quality of life (Pouwer et al., 2020; Pouwer & Nefs, 2019; Roy et al., 2020). These studies showed that individuals with T2DM were significantly more likely to experience psychological problems (e.g., anxiety, distress) than those without diabetes (Johansen et al., 2014; Pouwer et al., 2020; Pouwer & Nefs, 2019; Roy et al., 2020). In addition, almost one in four diabetes adults experience depressive disorders (Khaledi et al., 2019; Pouwer, Lubach, & Snoek, 2006). It may be the case that historical trauma/loss, although not directly related to self-management (as found in the present study), may be associated with general levels of anxiety, depression, and distress, which are known to impact T2DM self-management negatively. For example, researchers have found that higher historical loss was associated with higher levels of depression and anxiety among AI/AN adolescents (Armenta, Whitbeck, & Habecker, 2016; Brockie, 2012). Among AI/AN

adults, Ehlers et al. (2013) reported that higher levels of historical trauma/loss were associated with alcohol dependence and numerous psychiatric disorders. Similarly, several studies have established a link between historical trauma and depressive symptoms (see Tucker, Wingate, & O'Keefe, 2016; Walls & Whitbeck, 2011; Walls, Whitbeck, & Armenta, 2016). Thus, AI/AN women with T2DM may experience diabetes-related distress, anxiety, and depression, which may be exacerbated by historical trauma/loss.

The results from my study indicated that variables related to contemporary trauma (stressful life events and microaggressions) were significantly associated with poorer self-management of T2DM rather than historical trauma/loss experienced by AI/AN women. The historical trauma/loss literature has certainly highlighted the significant and devasting history of Indigenous people. However, as a scientific construct historical trauma/loss, it is unclear to what extent it directly impacts health outcomes (Baldwin et al., 2020; Gone et al., 2020) and specifically health-related behaviors such as self-management of T2DM. In this section (and following sections), I suggest that historical and contemporary trauma may lead to specific psychological conditions (e.g., anxiety, depression, distress) that interfere with health-promoting behaviors such as self-management of T2DM.

Hypothesis 2 – Historical Loss Associated Symptoms

In Hypothesis 2, I examined whether there was a significant relationship between historical loss associated symptoms (as measured by the HLASS) and T2DM self-management components. The results showed that HLASS (anxiety/depression,

anger/avoidance) were not significant predictors of any aspect of T2DM self-management (glucose management, dietary control, physical activity, healthcare-use, and total self-management) among this sample of AI/AN women.

The historical trauma construct includes the symptoms of anxiety/depression and anger/avoidance linked to the loss of cultural identity, land, language, and culture (Cromer et al., 2018; Duran, 2006; Skewes & Blume, 2018; Tucker, Wingate, & O'Keefe, 2015). The historical loss associated symptoms refer specifically to emotions or symptoms of anxiety/depression and anger/avoidance provoked by thoughts of historical trauma experienced by indigenous people (Whitbeck et al., 2004). The emotions of anxiety/depression and anger/avoidance are reminders of ancestral loss related to historical, ethnic cleansing, and genocide experienced by ancestors and transmitted within the tribe and interpersonally by the next generation.

Historical loss among AI/AN groups has been linked to mental health problems including suicide, violence, alcohol dependence, PTSD, depressive episode (not major depressive disorder), and drug dependence (Beals et al., 2013; Duran, 2006; Jones, 2005; Gone & Trimble, 2012; Salberg & Grand, 2016; Tucker, Wingate, & O'Keefe, 2015; Walls et al., 2017). It has also been reported that AI/ANs suffer depression associated with cultural connections, experiences of racial discrimination, trauma, poverty, and lack of access to mental health services that increase health problems and require appropriate interventions (Bird et al., 2016; Reschovsky & Staiti, 2005). In addition, AI/ANs frequently gather to transmit historical losses that also facilitate symptoms of depression (Tucker et al., 2015). Many AI/AN communities generally experience high levels of

depression which has been identified as a barrier to self-management of chronic diseases such as diabetes, heart, cancer, cirrhosis, nephritis (kidney disease), Alzheimer's disease, and hypertension (Aronson et al., 2016; Beals et al., 2013; IHS, 2020; Tann, Yahiku, Okamoto, & Yanow, 2007). It may be that general levels of mental health problems such as anxiety, depression, and distress negatively impact T2DM self-management rather than symptoms specifically associated with historical loss.

In the present study, historical loss, and associated symptoms (anxiety/depression, anger/avoidance) were not significant predictors of T2DM self-management. This appears to conflict with previous findings on the relationship between mental health and self-management behavior (e.g., Archer et al., 2012; Beals et al., 2005). More recent research appears to confirm this relationship (Chittem, Chawek, Sridharan, & Sahay, 2019; Schinckus, Dangoisse, Van de Broucke, & Mikolajczak, 2017). Chittem et al. (2019) examined the relationship between diabetes-related emotional distress and illness perceptions among patients with T2DM. The researchers specifically assessed perceived personal control over the illness, identity related to the illness, and illness-related concern. The results showed that higher levels of beliefs in personal control and illness-related concern predicted higher levels of diabetes-related distress. The authors suggested that higher levels of worry about diabetes were related to increased emotional distress about the illness. They also indicated that when patients feel obligated to engage in self-care, it can lead to higher levels of distress, especially when they perceive their self-care efforts as unsuccessful or insufficient. In a related study, Schinckus et al. (2017) examined whether emotional distress and depression moderated the relationship between

health (diabetes) literacy and diabetes self-management. The researchers established that high levels of health literacy resulted in improved T2DM self-management behavior. However, when patients exhibited higher levels of diabetes-related distress, the positive impact of health/diabetes literacy on self-management was negatively impacted. The same effect was found for depression. When patients reported higher levels of depression, the positive impact of health/diabetes literacy on self-management was negatively impacted.

The apparent inconsistency between the present study and previous research may be explained by how the symptoms were measured. In the present study, the symptoms of anxiety/depression and anger/avoidance were measured as they specifically related to historical loss (Whitbeck et al., 2004). The literature on mental health and self-management has not examined historical loss and associated symptoms. Previous studies examining mental health, diabetes, and diabetes self-management used general measures of distress and depression (e.g., Archer et al., 2012; Beals et al., 2005; Schinckus et al., 2017) or diabetes-specific distress (e.g., Chittem et al., 2019; Jannoo et al., 2017; Schinckus et al., 2017). Thus, while historical loss and associated symptoms may lead to the development of health-related problems like diabetes, it does not appear to impact self-management behavior. Instead, general levels of distress and depression and diabetes-specific distress appear to have a greater impact on day-to-day T2DM self-management behavior.

Hypothesis 3 – Contemporary Trauma (Stressful Life Events)

In Hypothesis 3, I examined whether there was a significant relationship between stressful life events and the components of T2DM self-management. The variable of stressful life events was the only significant predictor of dietary control. This result demonstrated an inverse relationship between stressful life events and dietary control. That is, increases in stressful life events predicted poorer dietary control.

Many AI/ANs experienced stressful life events such as accidents, homicides, suicide, and violence, as well as economic hardships, smoking, substance abuse, depression, risky behaviors, and discriminations (Beasely, Thompson, & Davidson, 2003; Gone, 2014; Hartmann et al., 2018; Soto et al., 2015). The AI/AN mental health system acknowledges stressful life events resulting from colonization that create the many health disparities experienced today (Gone, 2013; Hartmann et al., 2018). The health disparities experienced include heart disease, cancer, accidents, diabetes, alcohol, chronic lower respiratory diseases, stroke, chronic liver disease and cirrhosis, influenza and pneumonia, drug use, kidney disease, suicide, Alzheimer's disease, septicemic, assault/homicide, and essential hypertension diseases (Baldwin et al., 2020; IHS Fact Sheet, 2019).

Literature related to how stress impacts physiological functioning may explain why stressful life events may contribute to poorer dietary control among AI/AN women with T2DM. Stressful life events exposure has been linked to poorer physical and mental health. More specifically, psychosocial stressors may facilitate the development and progression of diabetes and found to interfere with successful lifestyle interventions (Elm et al., 2019; Wang et al., 2019). Wang et al. (2019) examined the associations between

the cumulative and specific stressful life events and the prevalence of diabetes among Chinese adults. Increases in the number of stressful life events significantly increased the likelihood of developing diabetes. In addition, specific stressful life events (e.g., loss of job, family conflict, death of family member, injury/accidents) also increased the likelihood of developing diabetes. The authors suggested that detrimental lifestyle behaviors, endocrine abnormalities, and chronic inflammatory processes accounted for the link between stress life events and diabetes. In a qualitative study on sources of stress among American Indian adults with diabetes, Elm et al. (2019) reported a continuum of stressors (chronic stressors, anticipation of stress, daily stress, stressful life event) that impacted the management of the disease. This study highlighted the importance of historical and contemporary trauma and health behaviors and outcomes.

Prolonged stressors also change hormonal reactions to normal stress that adjust to the body's allostatic load. Thus, persistent stressful life events may negatively impact the individual's brain functioning related to properly perceiving and responding to anxiety, controlling mood, using effective memory processes, and engaging in optimal decision-making (McEwen, 2012; Steptoe et al., 2013). Consequently, the brain circuits altered by stress may result in increased anxiety, poorer mood control, memory problems, and difficulty making decisions (McEwen, 2012). These issues could negatively impact dietary control and the management of diabetes.

Atypical depression (the relationship between the brain and body) may also help explain the lack of dietary control during stressful life events among AI/AN women with T2DM (e.g., Marano, 2016; Pecoraro, 2004). During a stressful life event, the brain

instructs the body to excrete the hormone cortisol, and the individual becomes vigilant, and their muscles are energized (Marano, 2016; Pecoraro, 2004). Once the cortisol returns to the brain, it stops affecting the body. However, if chronic stressful life events continue, cortisol excretion does not switch off and can result in long-term anxiety and depleted energy reserves (Marano, 2016; Pecoraro, 2004). The body then seeks extremely pleasurable comfort food containing high fats and sugars to replete energy (Pecoraro, 2004). Dietary control becomes insignificant, and quickly abdominal fat reaches the liver and sends a metabolic signal to the brain to shut off the stress response. If stressful life events continue, abdominal obesity increases and do not shut off, resulting in an increased risk of diabetes and heart attack (Marano, 2016; Pecoraro, 2004). This relationship between stressful life events and dietary control is compounded by the fact that AI/AN women typically only have access to food from food deserts (convenient stores and fast food outlets) that leads to poor blood sugar level control (Carlson et al., 2018; Gadhoke et al., 2015; Joassart-Marcelli, Rossiter, & Bosco, 2017). Researchers have reported that the AI/AN high level of obesity is related to the ignorance of RDA guidelines (Eilat-Adar et al., 2009). These researchers also found the food label instructions did not cater to those with a serious illness such as diabetes. Thus, stressful life events contribute to the development of T2DM and further aggravates the T2DM condition (Beasely et al., 2003; Soto et al., 2015; Steptoe et al., 2014).

Other recent studies examining the relationship between diabetes distress, decisional conflict, quality of life, and patient perception of chronic illness-care may shed light on the explanation of the relationship between stressful life events and poorer

T2DM self-management (Bruno et al., 2019; Jannoo et al., 2017). Diabetes distress is the psychological distress experienced when people with diabetes are expected to cope with a complex self-management regime. Jannoo et al. (2017) looked at the relationship between diabetes distress, medication adherence, diabetes self-care, and quality of life among type 2 diabetes patients. They found that high levels of diabetes-related stress were associated with lower levels of self-care. Those patients with higher levels of self-care had significantly higher health-related quality of life. Bruno et al. (2019) found a positive link between diabetes distress and decisional conflict (uncertainty, informed values, and effective decision-making related to diabetes) among patients with T2DM. More importantly, a negative relationship was reported between decisional conflict and chronic illness (diabetes) self-care (Bruno et al., 2019). The researchers concluded that diabetes distress is an emotional state, separate from depression, that also impacts patients with diabetes. More specifically, when diabetes distress increases, it results in higher decisional conflict (i.e., uncertainty in choosing options related to managing chronic disease). Ultimately, this decisional conflict was found to significantly reduce diabetes self-care (i.e., patient-initiated goal setting, problem-solving, and healthcare follow-up). The authors suggested that the results could be used to develop new interventions that focus on diabetes distress and collaborative decision-making to improve the quality of life of diabetes patients.

Hence, researchers have found that stressful life events and stress-related process may impact the individual's physical and mental condition to maintain effective dietary control (Gone, et al., 2019; Steptoe et al., 2014; Wang et al. 2019). Steptoe et al. (2019)

found that higher stress was found in diabetes patients regarding negative emotional and stressful experiences. Diabetic individuals reported higher levels of depression and hostile symptoms and higher levels of stress compared to healthy controls (Steptoe et al., 2014). Inevitably, neglected T2DM self-management due to stressful life events results in mortality, morbidity, loss of quality of life, and high costs (Wilkinson et al., 2014). Endemic T2DM is chronic and exceeds any epidemic in human history, and unquestionably requires behavioral intervention as part of the diabetes healthcare team (Cardel et al., 2020; Johansen et al., 2014).

Previous researchers found that some healthcare providers overlook the need for psychotherapy for T2DM distress, depression, anxiety, and eating disorders (Cardel et al., 2020; Johansen et al., 2014). Researchers have also found that tailoring cognitive behavioral therapy and lifestyle counseling in the management of Hemoglobin A_{1c} with adults living in rural areas enhanced T2DM treatment success (Cardel et al., 2020; Cummings et al., 2019; Evert et al., 2019), and applied to AI/AN women. However, in many cases, AI/AN women with T2DM comorbidities and disease complications exposed to historical and contemporary trauma may be vulnerable to pathological dysfunction and may experience diabetes distress and decisional conflict (Bruno et al., 2019; Gone, 2013). Previous researchers found that if healthcare providers know the patient's emotional burden, mental quality of life, and the patient's perception of chronic disease, appropriate interventions could improve T2DM self-care (Bruno et al., 2019; Gone, 2013). The current study confirmed and extended this body of research that AI/AN

women who experienced higher levels of stressful life events reported poorer dietary control related to T2DM self-management.

Hypothesis 4 – Contemporary Trauma (Microaggressions)

In Hypothesis 4, I examined whether there was a significant relationship between microaggressions (microinsults and microinvalidations) and the components of T2DM self-management. The results showed microinsults was not a significant predictor of any component of T2DM self-management. However, microinvalidations significantly predicted glucose management, physical activity, healthcare-use, and total T2DM self-management. Microinvalidations did not significantly predict dietary control. These results demonstrated an inverse relationship between microinvalidations and T2DM self-management. That is, higher perceived levels of microinvalidations predicted poorer self-management of T2DM (i.e., less frequent blood glucose monitoring, reduced physical activity, less frequent healthcare-use, and poorer overall total T2DM self-management).

Microinvalidations are part of the contemporary trauma construct that links microaggressions to the consequences of historical trauma. One of the reasons AI/ANs find microinvalidations more upsetting than microinsults is their strong connection to their culture (Jones & Galliher, 2015). Microinvalidations are one of three categories that include microinsults and microassaults (Clark et al., 2011; Jones & Galliher, 2015; Riel, 2019; Sue, Capodilupo et al., 2007). Microinsults are devious insults and impulsive understatements inappropriate to the targeted Native individual (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Lukianoff & Haidt, 2015; Pierce, Carew, Pierce-Gonzalez, & Willis, 1978). Microassaults are explicit racial derogations (verbal or

nonverbal criticisms) to hurt the intended injured party by using name-calling, avoidant behavior, or purposeful discriminatory actions (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Sue et al., 2007). Microinvalidations refer to comments that invalidate intra-ethnic differences and emphasize the homogeneity of the ethnic group (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Sue et al., 2007). Microinvalidations by others assume all ethnic minority groups speak the same language, have the same values, and the same culture (Bryant-Davis, 2018; Comas-Diaz, 2016; Fleischer, 2017; Sue et al., 2007). A microinvalidation is a hyponym of microaggression that suggests minority individuals experience "implications of being an alien in your own country" and are asked questions such as "where are you from?" or "how do you speak English so well? (Sue et al., 2007).

The daily conscious or unconscious actions, verbal remarks, non-verbal behaviors, the racial slights by white perpetrators target AI/ANs that advocate a sociopolitical dominance and suggest AI/ANs vanished or assimilated into mainstream America (Solorzano, Ceja, & Yosso, 2000; Virginia et al., 2015). Examples of the daily microaggressions that cause anxiety include locking a car door when a black man appears; asking a woman of color where she is from, refusing to pronounce a non-anglo name, a white student gives a professor of color advice or informs a Puerto Ricon he or she is not American (Chapman, Delapp, & Williams, 2014; Kanter et al., 2017; Sue, 2009; Torres, Driscoll, & Burrow, 2010; Williams, Kanter, & Ching, 2017).

Microaggressions experienced by AI/ANs may progress to psychological trauma through the many experiences over time or through one event that could trigger memories

of previous personal experience or collective traumatic experiences of oppression (Bryant-Davis, 2018). The psychological trauma or 'soul wound' to massive AI/AN groups resulted in contemporary trauma (Brave Heart, 1999a; Brave Heart et al., 2011; Brown-Rice, 2013; Heart, 2003; Mohatt, Thompson, Thai, & Tebes, 2014; Ong & Barrow, 2017; Salberg & Grand, 2016; Wall et al., 2017; Whitbeck et al., 2004). Contemporary trauma is the consequence of historical trauma and includes microaggressions (Jones & Galliher, 2015). Microaggressions are frequently experienced by AI/ANs who react sensitively to insulting remarks that give rise to high levels of stress, depression, and alcohol abuse to numb the psychological pain experienced that is part of the contemporary trauma experience (Elm, 2018; Elm, Walls, & Aronson, 2019; Fleischer, 2017; Jones & Galliher, 2015). Sittner et al. (2018) examined the relationships between racial microaggressions, diabetes distress, and self-care behaviors (diet and exercise). The results showed a positive relationship between microaggressions and diabetes distress. Microaggressions were also associated with depressive symptoms. Increases in diabetes distress had a direct link to poor self-care. Surprisingly, they found a positive relationship between microaggressions and exercise, suggesting that exercise may be a way of coping with stress.

Microaggressions differ substantially between ethnic groups, particularly within each category. Still, it is especially relevant to AI/ANs and the sociohistorical structure used by white supremacy in the United States to continue colonization (Wolfe, 2006). Contemporary colonization is a harsh, brutal experience for AI/ANs (Clark, 2007) and includes extreme cultural, economic, political, and ideological violence situations that

negatively impact AI/ANs psychological health (Corntassel & Witmer, 2008; Lyons, 2017; Williams, 2005). Microaggressions toward AI/ANs implies AI/ANs are extinct or vanishing (Clark et al., 2011).

Higher perceived levels of subtle and devious microaggressions increase psychological distress that can alter the physical condition (or biomarkers) of the individual that could cause disproportionate burdens of health adversities already experienced by AI/AN populations (Comas-Diaz, 2016; Fleischer, 2017; Gonzales et al., 2016; Paradies et al., 2015; Sue et al., 2007). There are complex clinical issues that arise from continual microaggressions, especially by those who already suffer mental problems (Fleischer, 2017). The microaggressions experienced by minority groups could cause unintended or intended psychological harm (Chapman, DeLapp, & Williams, 2014; Jang et al., 2017; Kanter et al., 2017; Sue, Zane, Hall, & Berger, 2009; Torres, Driscoll, & Burrow, 2010; Williams, Kanter, & Ching, 2017). Further, microaggressions create uncertainty in a victim, who then internalizes the negative feelings that result in psychological distress (Noh, Kaspar, & Wickrama, 2007; Wang et al., 2019). In addition, many researchers found different microaggressions among various ethnic individuals that increased stress (Blume, 2020; Elm et al., 2019; Torres et al., 2010; Wang et al., 2019), anxiety (Blume, 2020; Soto, Dawson-Andoh & BeLue, 2011), and depression (Blume, 2020; Huynh, 2012; Mouzon, Taylor, Keith, Nicklett, & Chatters, 2016; Nadal, Griffin, Wong, Hamit, & Rasmus, 2014). Microaggression victims also experience PTSD symptoms (Pole, Gone, & Kulkarni, 2008; Williams et al., 2017; Williams, Printz, & Delapp, 2018; Williams, Reed & Aggarwal, 2019), low self-esteem (Nadal et al., 2014;

Thai, 2017), obsessive-compulsive disorder (Williams, Taylor, Mouzon, et al., 2017), substance use (Blume et al., 2012; Clark, 2015; Gerrard et al., 2012), and suicide (Hollingsworth et al., 2017; O'Keefe et al., 2015). As a whole, the literature supports the current findings that microinvalidations result in poorer T2DM self-management among AI/AN women. A logical explanation is that contemporary trauma (stressful life events and microinvalidations) results in mental health issues (e.g., anxiety, depression, distress) that negatively impact health-promoting behavior (self-management of the disease).

Limitations of the Study

Traditional values and enculturation are more associated with AI/ANs living in reservations (Armenta, Whitbeck, & Habecker, 2016), and hence, they experience more discrimination (Tucker, Wingate, & O'Keefe, 2015). All the AI/AN women who participated in my study lived on the reservation at the time of the study and may have been more likely to hold traditional values which could have influenced the results. Thus, these results may not generalize to other AI/AN individuals who do not live on or near reservations. In addition, my study included AI/AN women diagnosed with T2DM for at least one year, who were aged 18 years or older, and registered at an AI/AN health center in the geographical area of southwestern United States. There are 565 Tribal groups in the United States that are diverse with their own history, traditions, values, and beliefs (Gone & Trimble, 2012). These different Tribal groups may experience different types of historical and contemporary trauma. Thus, the results from this study may not generalize to other AI/AN women with T2DM or worldwide Indigenous groups.

This quantitative study used a convenience sample of AI/AN women with T2DM in the southwestern United states to assess the relationship among historical trauma, contemporary trauma, and T2DM self-management. While significant relationships were found between stressful life events, microinvalidations, and self-management behavior, one cannot assume a cause an effect relationship between the variables. Another limitation in this study was related to the health status of the participants. While TD2M status was verified, specific information regarding the participants health status, medical history, medication, and physician treatment recommendations were not included in the data. Participants could have had various types of treatment and self-management guidelines related to the severity of their condition. It is also unknown whether participants adhered to those specific treatment plans.

Another factor that could have impacted the validity of the results might be related to the interaction between participants and the health center employees. Some of the health center employees may have discouraged women from participating in the study. Some participants did make comments to nurses that one of the doctors told them not to participate. In addition, some participants who visited the health center were employed by the Bureau of Indian Affairs located on the same premises and declined participation in my study because of personal historical trauma issues. These factors could have resulted in participants with higher levels of historical trauma being discouraged from participating in the study.

Recommendations

Perspectives from AI/AN women could provide an effective therapeutic, culturally oriented remedy to help AI/AN women deal with their stressors and their daily racial microinvalidations and improve resilience and focus on wellness and healing (Beasely et al., 2003; Gone, 2008; Hartmann & Gone, 2012). Previous researchers have suggested that AI/AN women's resilience and self-determination used over centuries could improve health disparities by considering a cultural approach by healthcare providers (Baldwin et al., 2020; Thomas, Mitchell, & Arseneau, 2016). Thus, future research should evaluate health outcomes and health promoting behavior (such as T2DM self-management) with prevention and treatment programs that combine Western biomedical approaches with traditional AI/AN healing practices. In addition, Gone et al. (2019) noted that the concept of resilience is a relevant construct that has not been investigated in the context of historical trauma/loss. Resilience refers to the ability to thrive despite experiencing significant types of adversity of traumatic events. Exposure to traumatic events is not always associated with negative physical or mental health outcomes (e.g., Baldwin et al., 2020; Bonano, 2004). Future research should consider assessing resilience and/or coping skills related to historical and contemporary trauma which might mediate the relationship between trauma and T2DM self-management behavior.

Future researchers should also consider a qualitative study that could examine the experience of historical trauma among AI/AN women which may provide insight on possible negative and/or positive health-related themes connected to that experience.

Similarly, a longitudinal study would allow researchers to evaluate any cumulative effects of historical and contemporary trauma on T2DM self-management not considered in this cross-sectional study. A longitudinal study may also identify other potential barriers to T2DM self-management.

Another recommendation is for continued research on the assessment of historical trauma. Historical trauma is a relatively new construct that emerged in the clinical and health science literature in the mid-1990s (Gone et al., 2019). Gone et al. (2019) conducted a systematic review of the small literature (approximately 32 articles) and noted that many of the studies reported significant associations between high levels of historical trauma and adverse health outcomes. However, due to complex analyses and very specific findings, there is no cohesive body of knowledge that identifies specific health policies or recommendations for professional practice. That is, historical trauma theory is described as a work in progress and it is unclear whether historical trauma is most helpful in metaphorical terms or literal terms. Historical trauma literature has brought attention to historical events and processes that have shaped the lives of contemporary AI/AN groups and other Indigenous peoples. However, there is a lack of consistency in terms of clear patterns of psychological harm because of historical trauma. Future research is needed to determine the role of historical trauma in explaining contemporary health outcomes and problems among AI/ANs (Gone et al., 2019).

Implications

One potential impact for positive social change could be that health professionals and diabetes education programs for AI/AN populations could include information

related to historical and contemporary trauma with the goal of improving resilience, coping, and strengthening their ability to self-manage T2DM. Other researchers have found that some healthcare providers generally overlook psychological factors when treating T2DM (Evert et al., 2019). Healthcare providers working with AI/ANs typically do not incorporate cultural aspects into their treatment plan. The results of this study could also be used by tribal organizations in attempts to reduce the disproportionately high diabetes rates, poor mental health, and other health disparities among AI/AN populations.

The stressful life events experienced by AI/ANs vary from Tribe to Tribe and include poverty, poor housing, or homelessness, lack of opportunities on reservation versus urban environments; and neighborhood safety (Myhra & Wieling, 2014). Nevertheless, healthcare providers and therapists working with AI/ANs need to be aware of the AI/ANs specific health disparities among Tribal groups (Baldwin et al., 2020; Goodkind et al., 2015; NCHS, 2016). Previous researchers found by partnering diabetes doctors with AI/AN healers or elders reduced T2DM patient's anxiety and increased T2DM self-management ability (Patel et al., 2014; Sanderson et al., 2012). AI/AN educators and healthcare providers could use these results to improve T2DM self-management and reduce high levels of mortality, morbidity, costs, and improve the quality of life among AI/AN women. Emphasis on the importance of culturally oriented therapy programs for AI/ANs should consider microinvalidations and stressful life events as barriers to T2DM self-management. Reducing or preventing microinvalidations and stressful life events could provide an effective therapeutic, culturally oriented remedy for

stressors and daily racial microinvalidations and improve resilience and focus on wellness and healing (Beasely et al., 2003; Gone, 2008; Hartmann & Gone, 2012). Researchers have recently suggested that AI/AN women's resilience and self-determination used over centuries could improve some of the health disparities reported in the literature (Baldwin et al., 2020; Thomas, Mitchell, & Arseneau, 2016).

Conclusion

There are many barriers to T2DM self-management including healthcare providers' ignorance of culture and factors such as microinvalidations and stressful life events that need consideration. AI/ANs experience of historical trauma and loss affects health when transmitted continuously to current generations. Thus, historical trauma and the cumulative emotional and psychological effects that pass through generations result in contemporary trauma experienced by AI/ANs. My study showed that these specific types of contemporary trauma (microinvalidations and stressful life events) negatively impacted T2DM self-management among AI/AN women. One possible explanation is that contemporary trauma results in significant mental health issues that reduce the ability to engage in health-promoting behaviors. The findings from this study will help future researchers extend the knowledge regarding historical and contemporary trauma on the psychological functioning, health, and health behaviors of AI/AN groups. The findings may also be used by educators and healthcare providers to promote positive social change by integrating cultural-sensitive approaches to the treatment of AI/AN groups.

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Appendix A: Diabetes Self-Management Questionnaire

IHS PROTOCOL NUMBER PXR 19.01

The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you.		Applies to me very much	Applies to me to a consider-able degree	Applies to me to some degree	Does not apply to me
1.	I check my blood sugar levels with care and attention. ☐ Blood sugar measurement is not required as a part of my treatment.	☐3	☐2	☐1	☐0
2.	The food I choose to eat makes it easy to achieve optimal blood sugar levels.	☐3	☐2	☐1	☐0
3.	I keep all doctors' appointments recommended for my diabetes treatment.	☐3	☐2	☐1	☐0
4.	I take my diabetes medication (e. g. insulin, tablets) as prescribed. ☐ Diabetes medication / insulin is not required as a part of my treatment.	☐3	☐2	☐1	☐0
5.	Occasionally I eat lots of sweets or other foods rich in carbohydrates.	☐3	☐2	☐1	☐0
6.	I record my blood sugar levels regularly (or analyze the value chart with my blood glucose meter). ☐ Blood sugar measurement is not required as a part of my treatment.	☐3	☐2	☐1	☐0
7.	I tend to avoid diabetes-related doctors' appointments.	☐3	☐2	☐1	☐0
8.	I do regular physical activity to achieve optimal blood sugar levels.	☐3	☐2	☐1	☐0
9.	I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	☐3	☐2	☐1	☐0
10.	I do not check my blood sugar levels	☐3	☐2	☐1	☐0

The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you.		Applies to me very much	Applies to me to a consider-able degree	Applies to me to some degree	Does not apply to me
	frequently enough as would be required for achieving good blood glucose control. ☐ Blood sugar measurement is not required as a part of my treatment.				
11.	I avoid physical activity, although it would improve my diabetes.	☐3	☐2	☐1	☐0
12.	I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). ☐ Diabetes medication / insulin is not required as a part of my treatment.	☐3	☐2	☐1	☐0
13.	Sometimes I have real ‘food binges’ (not triggered by hypoglycemia).	☐3	☐2	☐1	☐0
14.	Regarding my diabetes care, I should see my medical practitioner(s) more often.	☐3	☐2	☐1	☐0
15.	I tend to skip planned physical activity.	☐3	☐2	☐1	☐0
16.	My diabetes self-care is poor.	☐3	☐2	☐1	☐0

Appendix B: Historical Loss Scale

IHS PROTOCOL NUMBER PXR 19.01

How often you think	1	2	3	4	5	6	9
	Several times a day	Daily	Weekly	Monthly	Yearly or only at special times	Never	Don't know/ Refused
1. The loss of land							
2. The loss of our language							
3. Losing our traditional spiritual ways							
4. The loss of our family ties because of boarding/residential schools							
5. The loss of families from the reservation/reserve to government relocation							
6. The loss of self-respect from poor treatment by government officials							
7. The loss of trust in whites from broken treaties							
8. Losing our culture							
9. The losses from the effects of alcoholism on our people							
10. Loss of respect by our children and grandchildren for elders							
11. Loss of our people through early death							
12. Loss of respect by our children for traditional ways							

Appendix C: Historical Loss Associated Symptoms Scale

IHS PROTOCOL NUMBER PXR 19.01

Now, I would like to ask you about how you feel when you think about these losses.

	1	2	3	4	5	6	9
How often do you feel...	Never	Seldom	Some-times	Often	Always	Never	Don't know or Refused
1. Sadness or depression							
2. Anger							
3. Like you are remembering these losses when you don't want to							
4. Anxiety or nervousness							
5. Uncomfortable around white people when you think of these losses							
6. Shame when you think of these losses							
7. Sense of weakness or helplessness							
8. Loss of concentration							
9. Bad dreams or nightmares							
10. Feel isolated or distant from other people when you think of these losses							
11. Loss of sleep							
12. Feel the need to drink or take drugs when you think of these losses							
13. Rage							
14. Fearful or distrust of the intentions of white people							
15. There is no point in thinking about the future							
16. Like it is happening again							
17. Like avoiding places or							

people that remind you of these losses							

Note that not all of the items above were ultimately included in the final Historical Loss-Associated Symptoms scale. Please see Whitbeck, Adams, Hoyt, and Chen (2004) for further details.

Appendix D: Stressful Life Events Questionaire

IHS PROTOCOL NUMBER PXR 19.0

The items listed below refer to events that may have taken place at any point in your entire life, including early childhood. Please answer YES or NO to each question.

1. Have you ever had a life-threatening illness?
   NO _____ YES_____

2. Were you ever in a life-threatening accident?
   NO _____ YES_____

3. Was physical force or a weapon ever used against you in a robbery or mugging?
   NO _____ YES_____

4. Has an immediate family member, romantic partner, or a very close friend died because of an accident, homicide, or suicide?
   NO _____ YES_____

5. At any time, has anyone (parent, other family member, romantic partner, stranger or someone else) ever physically forced you to have intercourse, or to have oral or anal sex against your wishes, or when you were helpless, such as being asleep or intoxicated?
   NO _____ YES_____

6. Other than experiences mentioned in earlier questions, has anyone touched private parts of your body, made you touch their body, or tried to make you have sex against your wishes?
   NO _____ YES_____

7. When you were a child, did a parent, caregiver, or other person slap you repeatedly, beat you, or otherwise attack or harm you?
   NO _____ YES_____

8. As an adult, have you been kicked, beaten, slapped around, or otherwise physically harmed by a romantic partner, date, family member, stranger, or someone else?
   NO _____ YES_____

9. Has a parent, romantic partner, or family member repeatedly ridiculed you, put you down, ignored you, or told you are no good?
   NO _____ YES_____

10. Other than the experience you already covered, has anyone ever threatened you with a weapon like a knife or a gun?
    NO _____ YES_____

11. Have you ever been present when another person was killed?
    NO _____ YES_____

12. Have you ever been present when another person was seriously injured?
    NO _____ YES_____

13. Have you ever been present when another person was sexually assaulted?
    NO _____ YES_____

14. Have you ever been present when another person was physically assaulted?
    NO _____ YES_____

15. Have you ever been in any other situation where you were seriously injured or your life was in danger (e.g., involved in military combat or living in a war zone)?
    NO _____ YES_____

Appendix E: Daily Racial Microaggressions Scale

IHS PROTOCOL NUMBER PXR 19.01

	1	2	3	4	5
Please rate the items (14) below according to the scale (on your right) from 1-5:	This has never happened to me	This has happened to me but I was not upset	This happened to me and I was slightly upset	This happened to me and I was moderately upset	This happened to me and I was extremely upset
1. Someone was surprised at my skills or intelligence because they believed people of my racial/ethnic background are typically not that smart					
2. I was made to feel that my achievements were primarily due to preferential treatment based on my racial/ethnic background					
3. I was treated like I was of inferior status because of my racial/ethnic background					
4. Someone assumed I was a service worker or laborer because of my race/ethnicity					
5. I was treated as if I was a potential criminal because of my racial/ethnic background					
6. I was followed in a store due to my race/ethnicity					
7. I was made to feel as if the cultural values of another race/ethnic group were better than my own					
8. Someone reacted negatively to the way I dress because of my racial/ethnic background					

9. Someone told me that I am not like other people of my racial/ethnic background					
10. Someone asked my opinion as a representative of my race/ethnicity					
11. Someone made a statement to me that they are not racist or prejudiced because they have friends from different racial/ethnic backgrounds					
12. Someone told me that they are not racist or prejudiced even though their behavior suggest that they might be					

Appendix F: *Permission to use DSMQ*

Authors of Article:

- Andreas Schmitt
- Annika Gahr,
- Norbert Hermanns,
- Bernhard Kulzer,
- Jörg Huber and
- Thomas Haak

Appendix G: *Permission to use HLS and HLASS*

February 16, 2015

Dear Colleague:

Below you will find copies of the Historical Loss and Historical Loss-Associated Symptoms scales. There are separate forms for adolescents and adults. The adult form has been used with adults of various ages and has shown to have good psychometric properties. The adolescent form has been used with youths ranging from 10-19 years of age and has shown to have good psychometric properties. Further details may be found in the following manuscript and the various manuscripts that have used the measure since it was published.

Whitbeck, L. B., Adams, G. W., Hoyt, D. R., & Chen, X. (2004). Conceptualizing and measuring historical trauma among AI/AN people. American Journal of Community Psychology, 33, 119-130.

Scoring is straightforward. For the Historical Loss scale you will need to first reverse-score the items so that higher values indicate higher levels. Composite scores may then be computed by either summing or averaging across the responses to the items. Reverse scoring is not necessary for the Associated Symptoms scale, and either summing or averaging across the responses to the items may compute composite scores.

You are free to use the measures as you would like. However, note that the measures were developed for use with a specific North American Indigenous cultural group, which I am unable to name due to confidentiality agreements.

Please send me a summary of any results that you present (e.g., conference presentations, theses, dissertations, professional manuscripts) using the scales (lwhitbeck2@unl.edu).

If you have any additional questions, please do not hesitate to contact me.

Sincerely,

Les B. Whitbeck, Ph.D.
Department of Sociology
University of Nebraska Lincoln

Appendix H: *Permission to Use SLESQ*

Stressful Life Events Screening Questionnaire

Goodman, Corcoran, Turner, Yuan, & Green, 1998

To Obtain Scale
Available for download at http://ctc.georgetown.edu/339952.html

Lisa A. Goodman
Email: goodmalc@bc.edu

Measure availability: We provide information on a variety of measures assessing trauma and PTSD. Qualified mental health professionals and researchers intend these measures for use. Measures authored by National Center staff are available as direct downloads or by request. Measures developed outside of the National Center can be requested via contact information available on the information page for the specific measure.

Lisa Goodman <lisa.goodman@bc.edu>
Today, 4:55 PM Dorothy Jolley

Hi Dorothy,

You have my permission to use the scale, attached here.

Best of luck in your research!

Lisa Goodman, Ph.D.
Professor
Department of Counseling and Developmental Psychology
Lynch School of Education
310 Campion Hall
Boston College
Chestnut Hill, MA 02461
617-552-1725

Appendix I: *Permission to use DRMS*

Daily Racial Microaggressions Scale

Permission to use the DRM Instrument

Mercer, Sterett <sterett.mercer@ubc.ca>

Wed 4/19, 11:00 AM Dorothy Jolley <dorothy.jolley@waldenu.edu>

Dear Dorothy,

You have permission to use the scale in research. Please see the attached article/appendix for the scale, including the updated scale name.

Best wishes for your study!

Sterett

Sterett H. Mercer, Ph.D.
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