

4-2019

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## NSUWorks Citation

Bivins, Balkys L.; Hershorin, Indra R.; and Umadhay, Lonar Anthony, "Haitian American Women with Type 2 Diabetes Mellitus: An Integrative Review" (2019). *Ron and Kathy Assaf College of Nursing Faculty Articles*. 246.

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## Haitian American Women with Type 2 Diabetes Mellitus: An Integrative Review

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**Publication:** March 14, 2019; **Published:** March 18, 2019

### Abstract

Diabetes is escalating at staggering levels in the United States and worldwide. This paper will present a review of relevant literature that supports the need for research in Haitian American women, a particularly vulnerable group, with type 2 diabetes mellitus. It will also unveil the cultural factors that pose challenges to the treatment and management of this condition.

**Keywords:** Haiti; Type 2 Diabetes Mellitus; Haitians with Diabetes; Haitian Women with Diabetes; Management of Diabetes in Haitians; Management of Diabetes in African Americans

### Introduction

Diabetes is growing at epidemic proportions, not only in the United States but globally. Recent statistics estimate that 422 million persons are diagnosed with diabetes globally [1], 30.3 million of whom are in the United States [2]. Among those cases, 90-95% are type 2 diabetes mellitus (T2DM) a specific form of diabetes that is preventable in most instances [2]. African Americans struggle with type 2 diabetes mellitus at a disproportionate rate to that of their White counterparts. Specifically, Haitian Americans, a subset of the African American community, face numerous obstacles with the treatment and management of type 2 diabetes [3]. Haitian American women (HAW) with type 2 diabetes mellitus are at a higher risk of complications than Haitian American men [4]. The purpose of this literature review was to uncover salient research related to the care of HAW with T2DM. The scarcity of available research in this unique and marginalized population clearly indicated the need to fill the gap in the literature on the phenomenon of HAW with T2DM.

### Methods

Thomas Kuhn [5] asserted that the researcher must find relevance for a research inquiry through a critical review of the literature. Thus, to increase understanding of the historical and current data of the phenomenon of HAW with T2DM, a search of the literature was conducted with the initial criterion of a five-year

limit from the publishing date. The search parameters were eventually extended to 1898 in order to acquire seminal information on African Americans and, specifically, African American women, as HAW are often subsumed in this population. The databases used included the Cumulative Index of Nursing and Allied Health Literature (CINAHL), Cochrane, EBSCO, ERIC, Medline, PsycINFO, and SocINDEX, and the search covered the years of 1898-2017. An extensive review of the literature on the subject of type 2 diabetes mellitus revealed 52,845 articles. Using the keywords diabetes and Haitians retrieved 229 articles. Additionally, a search of the terms type 2 diabetes mellitus in African American revealed 141 articles. To understand the historical perspective of diabetes in the United States, the inquiry was extended to 1898 and yielded two more articles. Finally, after thematizing the articles and subcategorizing the data, eighteen pertinent articles were selected to complete this comprehensive literature review. Four main content areas resulted from the literature review: historical context of diabetes in Haiti, diabetes in African American women, adherence to treatment and management of T2DM, and cultural factors in T2DM management. A synthesis of the literature highlighted a significant research gap regarding diabetes in Haitian American women.

### Results and Discussion

#### Historical context of diabetes in Haiti

The literature and collected data on diabetes in HAW are scant. However, there is information on diabetes and its historical preva-

lence in persons of African ancestry. As a result, the literature regarding the evolution of diabetes in Blacks will pertain to African Americans, and, in particular, to African American women. Also, relevant information on diabetes in Haitian Americans will be explored.

According to Pancoast [5], in an article published in the Johns Hopkins Hospital Bulletin, although physicians were aware of the risk factors related to diabetes such as family history, age, nutrition, and obesity at the turn of the 20<sup>th</sup> century, American physicians did not recognize the disproportionate prevalence of diabetes in persons of African ancestry at the time. Pancoast was invited before the medical society at Johns Hopkins University to present the case of a Black male diabetic patient as a result of the perceived rarity of the disease in Blacks. At that event, Pancoast [5] stated, "the patient is shown because diabetes in the Negro is rather rare" (41). Although diabetes was regarded as uncommon in "the colored race" by a well-established medical practice in America, it was then already recognized that the number of Black women with diabetes outnumbered the number of Black men with the disease [5].

Tuchman [6] stated that Lemann, a medical faculty member at Tulane Medical School in Louisiana, appraised data from 1898 to 1926 and noted a higher incidence of diabetes in Black patients as compared to Whites in the 1920s. Although other factors impacting mortality such as syphilis, tuberculosis, maternal and infant mortality, and heart and kidney disease were noted in this population by the late 1930s, diabetes was still not included among the top twenty-one causes of deaths in Blacks in the South during the same period. In 1942, Julian Herman Lewis, a Black pathologist building on Lemann's work, sought to change this misperception by challenging the incorrect assessment of diabetes in Blacks. Noting the persistent lack of attention to Blacks with diabetes despite increasing evidence of its prevalence, Lewis continued his work to expose the unfounded myth of the Black population's "relative immunity" to diabetes.

When the U.S. Public Health Service commissioned a comprehensive study on diabetes to elucidate its impact on an estimated two million Americans in 1947, it was conducted in the predominantly White community of Oxford, Massachusetts. Although Oxford was representative of many small towns in the U.S., it did not include a sizable Black population. Accordingly, the resultant research did not address or inform on the prevalence of diabetes in Black persons nationally. To the detriment of the progress being achieved by Lewis and others in debunking the myth surrounding Blacks and diabetes, the study findings perpetuated the incor-

rect notion of diabetes as an affliction almost exclusively within the White population. For example, a documentary based on the study, produced by U.S. Public Health titled "Diabetics Unknown" described the at-risk population for diabetes as "fair, fat, and forty" [6]. The lack of awareness or focus on diabetes in the Black population continued throughout the 20th century, until at least the 1960s [6]. The present crisis state of diabetes in Black persons and Black communities may trace back, in part, to this systemic delay of recognition, treatment, and attention from the medical profession toward this population, with regard to the disease.

In a more recent study conducted by Rosen, *et al.* [7], the researchers pointed to a disparity that exists in the prevalence of T2DM for Haitians in Miami, Florida but did not arrive at a separate prevalence rate for Haitian women. The study results revealed an impaired fasting blood sugar levels ratio of 8:2, favoring women to men. The criterion for impaired blood sugar levels is 100-125; in this study, the researchers reported that most of the subjects with impaired blood sugars were on the higher end of 126. The researchers also stated that study subjects with impaired fasting glucose levels of less than 99 comprised 47% of the patients; 20% of the subjects had glucose levels between 100-126; and 33% of the subjects had glucose levels of 126 and higher, a level that prompts a diagnosis of T2DM. According to these results and observations, the researchers concluded that Haitians have a prevalence rate of 33% for diabetes and are at risk compared to the other demographic populations in the literature. This increased risk in the Haitian community was second only to the prevalence rate for diabetes of 50% found in Pima Indians.

Jean-Baptiste, *et al.* [8] conducted the only study that specifically addressed the prevalence of diabetes in Haitian women. This published work on diabetes is one of the few research articles about T2DM in Haiti. The results of the study revealed a response rate of 69% and age-standardized prevalence of diabetes at 8.9% in women and 4.8% in men. These results reached a statistical significance of  $p < .05$ . The researchers also reported the age-standardized prevalence of pre-diabetes 8.0% in women and 6.4% in men [8].

According to Samuels, *et al.* [9], as a result of Haiti's chronic poverty and lack of infrastructure, exacerbated by devastating natural disasters that have resulted in widespread record loss and inaccessibility, any germane vital epidemiological studies conducted in the past are now unknowable and irretrievable. The current state of affairs in Haitian politics also does not lend itself to academic study generally or with regard to diabetes, specifically. Consequently, the study by Jean-Baptiste, *et al.* [8] is the only article found to inform

the current state of diabetes in Haiti. This study highlights the disparity that exists in the prevalence of diabetes in Haitian women as compared to Haitian men. No current statistical data on T2DM in Haitian women exists, and a preliminary study on the prevalence of T2DM in Haitian persons in the United States conducted in 2007 provided limited information on the topic.

### Diabetes in African American women

Research on HAW with T2DM is sparse. Data relevant to Haitians and HAW are included in the data on African Americans. As a result, this section will address four studies on diabetes in African American women. Of significance to this inquiry, diabetes is increasingly prevalent in the African American community, and African American women with T2DM outnumber African American men with T2DM.

Miller, *et al.* [10] conducted a descriptive cross-sectional survey in the southeastern United States in accordance with the “Healthy People 2020” guidelines for diabetes management. The aim of the study was to illustrate the management of T2DM in obese African American women, a group with increased affliction of diabetes-related complications. The study used a convenience sample consisting of 96 African American women (average age =53) enrolled in nutritional and weight control intervention programs. The criteria for selection were: (1) a diagnosis of T2DM for six months or longer; (2) an increased risk of microvascular and macrovascular complications such as a BMI of thirty or greater; (3) a systolic blood pressure of 130 mm Hg or greater; and (4) Hemoglobin A1C (HbA1c) 7.0% or greater. According to Choi, *et al.* [11] HbA1c is a standardized laboratory tool used to diagnose diabetes.

Data were collected using the established Summary of the Diabetes Self-Care Activities (SDSCA) questionnaire. Chi-square tests were used to look at the relationship between dietary advice and advice on physical activity and dietary and physical activity behavior. SPSS software version 22 was used to analyze the variables. Ninety-six African American women completed the questionnaires. The average age of the subjects was 53, and the BMI was 37.9 (+/- 7.3 kg/m<sup>2</sup>). The results revealed that in examining the relationship of self-care against the Healthy People 2020 guidelines, the results were 48.9% vs. 62.5% for diabetes education, 35.1% vs. 74.8% for feet examinations (which were below the guidelines for Healthy People 2020), and 70.1% vs. 58.7% for dilated eye exams (these results were higher than the Healthy People 2020 guidelines). All differences were statistically significant at the a priori level of  $p < 0.05$ .

Half of participants (50%) reported receiving advice on physical activity; however, the most prevalent advice focus was regarding diet, with 58% reporting having received dietary advice. Lack of advice on exercise was linked to higher odds of engaging in little to no physical activity (OR = 3.38) and planned exercises (OR = 2.65). The researchers recommended that future longitudinal studies examine the association between providers and self-care behaviors in T2DM. In addition, factors such as insurance coverage, insurance policy enticement, and optimal ways to connect clients to referred specialty providers were also addressed.

Murrock, *et al.* [12] conducted a qualitative study in a family practice office in the Midwest, with the objective of understanding the personal experiences of women managing T2DM as it relates to lifestyle influences. A convenience sample of 24 African-American women with T2DM was recruited for the study. The criteria for participation in the study included: (1) African American with T2DM greater than one-year duration; (2) English literacy; (3) eighteen years of age or greater; and (4) acknowledgement of participation in a program of education and management of diabetes. The study design included twenty-four participants grouped into four focus groups directed by an African American dietitian certified as a Diabetes Educator (CDE). The participants ranged in age 19-84 years old, were all single, and earned less than \$20,000 per year. Data collected were coded, and themes were identified and conceptualized.

The findings consisted of four themes, which included: (1) frequent difficulties and struggles in managing diabetes; (2) a need for individualized guidance; (3) a need for support; and (4) demonstrated misinformation or gaps in diabetes education. No subthemes were identified. Recommendations identified by the researchers included conducting a more representative study to examine more effective strategies to increase diet management in African American women, which may lead to better glycemic control and outcomes.

Miller, *et al.* [13] conducted a qualitative study in the southeastern United States to identify patient-centered outcomes that would be important to African American women with T2DM. A purposive sample was used to recruit thirty-four African American women with T2DM for two group-based nutrition and weight control interventions. The criteria included T2DM diagnosis for six months or greater, age thirty-four or greater, and HbA1c of 7.0% or greater or BMI 30 or greater. The intervention consisted of four to five two-hour sessions, with an overview of diabetes self-care behavior and self-management approaches.

Findings consisted of major themes and subthemes. The major themes included: diet, general education/control, weight loss, exercise, blood sugar control, self-care consistency, no medication, disease free, and family prevention/management support. Other themes included learning to deal with stress, guilt, and shame associated with diabetes, getting motivated, and a desire to live longer. The subthemes under diet included specific dietary behavior, general diet, and linkage to broader health goals. Through the study exercise, the researchers were able to distinguish several themes that were specific to patient-centered-outcomes in the participants. Recommendations for future studies included finding ways to explore patient-centered outcomes in larger cohorts of African American women with T2DM.

Willig, *et al.* [14] conducted a mixed methods study in the southeastern United States addressing the dietary beliefs of African-American women who were living with diabetes, as well as their perceptions regarding intuitive eating concepts. Intuitive eating (IE) is a technique that helps individuals appreciate when they are satiated. It has been used in interventions to decrease weight and blood sugar levels, through changing eating habits, in other populations.

A convenience sample of thirty-five African American women meeting the sample criteria were arranged into four focus groups of four to ten participants. The women were obese, approximately fifty-two years old, and most rated their current health status as being between fair and poor. Descriptive statistics were used to illustrate demographic data using SAS version 9.2 2008. The study used a twenty-six-question instrument with a Likert scale from one to four points, with the higher value demonstrating greater adherence to IE (mean scores of four) and lower scores of one demonstrating low adherence. Researchers used the Framson and colleagues scale validated in past studies to evaluate eating behavior and mindfulness.

Findings consisted of three main themes and subthemes. The main themes included the influence of diabetes diagnosis on food choices, feelings of stigma and guilt, stigma related to diabetes, and lack of recognition of intuitive eating (IE) practices. The subthemes that emerged in association with the diagnosis of diabetes on dietary regimen included a heightened awareness of dietary choices following diagnosis and social stigma and guilt associated with having T2DM. In this study, many participants reported that satiety was perceived as nausea or feeling very full. Since it has been found that African American women have difficulty determining

when satiety occurs generally, the researchers recommended future interventions geared to IE for this specific cultural group to determine if such programs may be of value to diabetes related outcomes. IE programs help participants to identify when they have achieved satiety.

In the study by Miller, *et al.* [10], the researchers suggested that since African American women with T2DM have a greater risk of complications, lifestyle modification should be included in their management plans by healthcare providers to offset the burden of complications in this group. The qualitative study by Murrock, *et al.* [12] explored the challenges in dietary self-management in African American women with T2DM. The themes revealed that the African American women expressed a need for further assistance with lifestyle factors in the pursuit of optimal glucose control. In the qualitative study by Miller, *et al.* [13], the researchers concluded that patient-centered outcomes are needed in African American women with T2DM to decrease complications. Finally, the study by Willig [14] revealed that African American women generally did not apply intuitive eating techniques in their daily lives. The findings from these four studies revealed that African American women experience several challenges in managing T2DM.

#### Adherence to treatment and management of Type 2 Diabetes Mellitus

Since the word adherence prevails in diabetes research, a description of the term is necessary. According to Haynes, *et al.* [15], adherence is characterized by an individual's ability to maintain successfully the prescriptive treatment protocol from his or her health provider in relation to his or her medications, diet, and lifestyle modifications. As lifestyle changes are essential to maintain normal blood glucose in individuals with T2DM, this section will review five pertinent articles relating to diet and lifestyle in minority populations.

Tovar, *et al.* [16] conducted a descriptive cross-sectional study in Boston to examine the baseline socio-demographic characteristics and self-reported diet and physical activity changes among new immigrant women participating in a randomized controlled lifestyle intervention (Live Well). The purpose of the modification program was to reduce weight gain in immigrant mothers and children (aged three to twelve) from Latin America, including Brazil (which, though part of Latin America, is addressed separately here) and Haiti.

The convenience sample included 383 women with a mean age of 36.1 years who had been in the U.S. an average of six years; 55% were married, and 43% had two children. The nationality and ethnic breakdown of study subjects was as follows: Brazilian (n = 138), Haitian (n = 131), and Latina (n = 114). The subjects were recruited using outreach efforts via churches, community organizations, beauty salons, and flyers. They completed a self-administered acculturative survey using a ten-point Likert scale, where one signified more American and ten signified more Brazilian or Haitian or Latina. No information about this instrument, including validity or reliability, was disclosed.

A Chi-square test was used to measure categorical variables such as age, education, number of children, and duration in the U.S. The frequency distribution included ethnicity, weight, exposure to diet, and physical activity, and outcome was analyzed using a ten-level scale for self-reporting. Further, the researchers used a multivariate regression and a quadratic formula to measure nonlinear association among continuous variables such as BMI, exposures to dietary alterations, exercise, and the outcome to represent weight changes. Data analysis was performed with SAS 9.2 software with a significance level of 0.05.

Results indicated that dietary alteration was significant when compared to BMI as ( $B = 0.1, p = 0.05$ ). The change in exercise pattern as compared to BMI was also significant at ( $B = 0.3, p = 0.01$ ). There was significant difference ( $p < 0.0001$ ) across the groups; 49.6% of the Haitian women were obese with ( $BMI > 30$ ) versus Brazilians at 25.9% and Latinas at 38.9%. The Haitian women also scored significantly higher on a scale measuring the change in their diet at 8.0 ( $p < .05$ ) versus a score of 5.8 for Brazilians and 6.9 for Latinas. The study also showed that Haitian women were more likely to have lower incomes, with 60% earning less than \$200 per week compared to 3% for Brazilians and 33% for Latinas ( $p < 0.0001$ ). The Haitian women also reported a higher percentage of being unmarried, at 63% compared to 25% of Brazilians and 49% in Latinas. In addition, Haitian women had more children as well, with 34% having more than three children versus 13% of Brazilians and 22% in Latinas.

In light of these findings, the authors speculated that the Haitian women subjects may not have reported all data honestly as a result of possible fear about their immigration status or benefit issues. The researchers recommended future research to study the shift in dietary and physical activity styles after settling in the United States among different immigrant groups categorized by their native countries.

Davis, *et al.* [17] conducted a quantitative descriptive cross-sectional survey to examine and anticipate the dietary patterns of low-income Blacks and Hispanics of Caribbean descent with diabetes living in the South Bronx, New York. The researchers hypothesized that differences in diet that are culturally based may impact obesity, glycemic control, HbA1c, and diabetes management in certain groups. The random sample consisted of 235 subjects from an HbA1c research study. The subjects completed the modified Block 2005 Spanish FFQ (food frequency questionnaire) that included 156 food items and eleven beverages to determine dietary intake. The instrument was reported to be a reliable measure of dietary intake.

A Mann Whitney U-test and Chi-square test were used to determine predictors of dietary patterns, such as the participants' native tongue, place of birth, and years in the U.S. The findings suggest that the participants who completed the study were more likely to have received diabetes education (21% versus 10%) ( $p < .0001$ ). They were also more likely to be women (70.6% versus 61.7%) ( $p < .002$ ) and were more likely to have some college education (29.3% versus 21.3%) ( $p < 0.046$ ). Results identified five major food groups that were dominant in this study population: Caribbean starch, pizza and sweets, fruits and vegetables, meats, and fried foods. The Caribbean starch diet was negatively correlated with years in the U.S. The multivariate analysis revealed ( $-0.02; p < .005$ ) higher education was also negatively correlated with a Caribbean starch diet ( $-0.25; p < 0.05$ ). Income greater than \$50,000 was positively correlated with the Caribbean diet ( $0.72; p < 0.05$ ). The constant was  $-0.26$  with  $R^2 0.33$ . The researchers reported no independent correlation between ethnicity and dietary patterns, but Hispanics who had been in the U.S. longer tended to eat less Caribbean starch. The study results supported the hypothesis that differences in diet that are culturally based may impact obesity, glycemic control, HbA1c, and diabetes management in certain groups.

Huffman, *et al.* [18] conducted a descriptive correlational study in South Florida and examined the role that medical advice plays on diet, diabetes self-management, and glucose control in minority populations. The convenience sample included 254 Black subjects, including 129 Haitian Americans (HAs) and 125 African Americans (AAs). The researchers used the Diabetes Self-Management (DSM) score, a subscale of the valid and reliable Michigan Diabetes Questionnaire by Fitzgerald and colleagues that was previously validated for African Americans and Caucasians. The DSM composite score was created from the Likert sub-scale variables, including DSM care adherence, dietary patterns, exercise barrier, health beliefs, and

heart disease. Cronbach alpha met all measured sub-scales of the DSM composite. A high score demonstrated a high DSM. The student t-test was used for continuous variables and Chi-square for categorical variables. The researchers used logistic regression to look at the correlation variables. Using SPSS version 18.0, the level of significance was set at  $p < 0.05$ .

The results indicated that the differences between the two groups were significant for older HAs (58 +/-9.9 versus 54.2 +/-10.1)  $p < .0002$ ). HAs were less obese with a BMI on average of 29.4 +/- 5.2 versus AAs 35.6 +/- 8.6 ( $p < .0001$ ). HAs scored higher on the DSM score with an average of (68.2 +/- 9.3) versus AAs (63.4 +/- 10.2) ( $p < .0001$ ). The researchers reported a significant difference in insurance status between the two groups, with a lower percentage of HAs having insurance at 55% ( $n = 71$ ) versus AAs at 79.2% ( $n = 99$ )  $p < .0001$ . HAs were more likely to be married 62% ( $n = 80$ ) versus AAs 26.4% ( $n = 33$ ) and HAs were less educated 45% ( $n = 58$ ) versus AAs at 82.4% ( $n = 103$ ). HAs were less likely to smoke, at 6.9% ( $n = 9$ ) versus AAs at 34.4% ( $n = 43$ )  $p < .0001$ .

The data for HAs revealed that there was a positive correlation between receiving dietary advice and use of a diet plan ("using an exchange list or food groups to plan a meal" at least sometimes versus seldom or never) with an odds ratio of 2.98 (CI 1.34 to 6.63)  $p < .0007$ . The researchers did not report a similar positive correlation in AAs. The DSM scores did not reveal a significant correlation with glycemic control as a measure of HbA1c for HAs, whereas in AAs the DSM scores were significantly negatively correlated with suboptimal glycemic control (HbA1c > 7.2). For AAs, higher DSM scores were associated with a lower rate of suboptimal control with an odds ratio of 0.94 (CI 0.90 to 0.97)  $p < .0002$ . Of note, the DSM scores were not previously validated with Haitian Americans. In this study, the DSM scores were negatively correlated with HbA1c above a threshold of 7.2% for AAs but did not reveal a correlation in HAs.

Ryan, *et al.* [19] conducted a prospective longitudinal cohort study in South Florida to determine the effect of a diabetes self-management education (DSME) program on a series of outcomes, including knowledge about the disease process, physical attributes, and laboratory metrics. The research questions and theoretical framework were not identified. A convenience sample of 73 subjects enrolled to complete the four-class program; however, only 41.95% completed the class. The majority of patients were non-Hispanic Black (57.5%) or Hispanic (35.6%). The instrument used was the well-established Morisky Medication Adherence Measure,

with a 5-point Likert scale to determine the ability to change behavior and health outcomes. Neither the points on the Likert scale, nor the validity or reliability of the Morisky Medication Adherence Measure, were disclosed. Data analysis for a 32-month span of time was used and consisted of a two-tailed t-test for continuous variables and Chi-square that was used to compare proportions using SPSS version 15.0. P values < 0.05 a priori were considered statistically significant.

The study revealed short-term improvements in patient knowledge following the program, with tests scores for diet and nutrition rising from 0.56 to 0.67, glucose monitoring from 0.71 to 0.82, and diabetes complications from 0.67 to 0.81 ( $p < .0001$ ). An improvement in knowledge regarding diabetes management was also noted with scores improving from 0.58 to 0.69 ( $p < 0.003$ ). Longer-term results for patient willingness to change behaviors did not reveal improvement; however, except in readiness to change eating behavior, with scores rising from 3.80 to 4.53 ( $p < 0.016$ ). Overall, there was a significant change in HbA1c from 8.60% to 7.78% ( $p < 0.007$ ) in a total of 44 patients for which it was compared; the effect of not including 29 other participants cannot be determined. Among the forty-four patients studied, fourteen had HbA1c < 7% at baseline and 20 had HbA1c < 7% at follow-up ( $p < 0.001$ ). The researchers did not identify any predictors for patients who completed versus patients who did not complete the program. Although six patients showed improvement, whether this would have remained significant if the data from the other 40% of patients were included cannot be ascertained. In addition, the number of patients categorized as overweight (BMI > twenty-five) went from 46 to 47 ( $p < .0001$ ), revealing that the intervention did not have the anticipated impact.

The results of the study highlight the difficulty that minority populations have with the treatment and management of T2DM. While there were 522 eligible individuals, 174 individuals enrolled in the program, and only 46 showed any improvement in knowledge. Only six individuals, or 3.4% of the subjects, benefited from the program. The findings indicate that the current approach to diabetes education in minority populations may be deficient.

Vimalananda, *et al.* [20] conducted a descriptive, cross-sectional study that compared diabetes management among Haitians, African Americans, and non-Hispanic Whites in a local hospital in Boston, Massachusetts. The purpose of this quantitative study was to examine a group of Haitians, compared to other ethnic groups, and to determine their Hemoglobin A1C. The convenience sample size included 2,652 clients, of which 1,472 were African American, 466 were White, and 715 were Haitian.

Data analysis was performed using SAS statistical software version 9.1. A Chi-square test was used to calculate cross-tabulations, and multiple regression analysis was performed on the predictors of race and ethnicity. The regression model included language spoken, gender, age, sex, and insurance coverage and included primary care visits and endocrinologist visits greater than 2 years' duration.

The results revealed an HbA1c of 7.7% for African Americans and Whites as compared to an HbA1c of 8.2% for Haitians ( $p < .0001$ ). The researchers deduced that Haitians in general have poorer glycemic control as compared to White and African American clients. In addition, Haitians had hypertension and inadequate control of low-density-lipoprotein (LDL), which are both correlated with inadequate care and treatment of diabetes [19].

The study by Tovar, *et al.* [16] confirmed the effectiveness of lifestyle and nutrition intervention in increasing positive health outcomes in new immigrant families, including Haitians. The descriptive survey-based study by Davis, *et al.* [17] analyzed dietary patterns in people of Caribbean descent in the United States, while the Huffman, *et al.* [18] study indicated less significant results from DSM given to Haitian study participants. Finally, Vimalananda, *et al.*'s [20] quantitative analysis of outcome impacting factors in Haitian patients compared to Whites and African-American concluded that Haitians generally had worse results that correlated with inadequate treatment of their diabetic condition. The findings from the studies by Tovar, *et al.* [16], Davis, *et al.* [17], Huffman, *et al.* [18], Ryan, *et al.* [19], and Vimalananda, *et al.* [20] suggest that minority populations experience difficulty with adherence to treatment and management of T2DM. Building on these insights, research on HAW with T2DM is well indicated.

### Cultural factors in Type 2 diabetes mellitus management

The review of the literature highlighted the important role that culture plays in the management of types 2 diabetes mellitus in different groups. As a result of a scarcity of research focused on Haitians and those of Haitian descent, this review includes studies conducted among other culturally distinct groups as well. These studies revealed salient ways in which culture may influence aspects of health behavior and T2DM management. Although specific cultures may differ, the impact of culture across these different groups informs the inquiry with regard to HAW with T2DM. The following four articles will discuss the cultural influences of diabetes in Haitians and other ethnic groups.

In a qualitative ethnographic study, Nguyen and Edwards [21] evaluated the barriers and facilitators of diabetes self-management in Vietnamese Americans (VA) in Oklahoma. The participants who met the sample criteria were recruited from places of worship and consisted of nine Vietnamese men and fourteen Vietnamese women older than 63 years old with a diabetes diagnosis of more than five years. Most of the information was gathered through tape-recorded interviews and field notes that were transcribed word for word by the researcher. The researchers used Nvivo software to load, organize, and determine the themes and categories. The themes that emerged were as follows: perceived barriers to diabetes self-management, side effects of Western medication, limited English proficiency, limited diabetes literacy, time and motivation, unhealthy eating habits, cost of monitoring supplies, family assistance, belief of fatalism, lack of transportation, witnessed sufferings, self-reliance, fear of pain, peer advice, and perceived facilitators to diabetes self-management.

A key study finding suggested that clients in that population had a great dependence on informal, community-based resources for their medical information. The researchers recommended that bilingual healthcare workers be afforded the opportunity to work with future clients in an informal manner and that connection with other communities could possibly be an advantage to the clients and contribute to nursing research. Based on the results of the study, training bilingual healthcare workers may bridge a gap between the community and providers to increase accessibility of resources in the community. This could potentially enable culturally tailored strategies with the purpose of avoiding barriers in these unique communities. This article discussed and illuminated key factors in caring for diabetes patients in Vietnamese American clients and similar populations and identified both barriers and facilitators of diabetes care. The results revealed that knowledge of these barriers and facilitators of diabetes management could inform health professionals in the care of their clients.

Brown, *et al.* [22] examined the outcome of culturally competent diabetes-self-management-education (DSME) in Mexican Americans with T2DM. This prospective randomized experimental study was conducted near the U.S.-Mexico border in Starr County. A total of 256 individuals aged thirty-five to seventy were divided equally between the experimental and control groups. The experimental group received the culturally competent diabetes education and the control group received the traditional information. The specialized education consisted of self-glucose monitoring, exercise, and

support groups totaling 52 hours over the span of 12 months with the aid of bilingual Mexican health professionals. The factors being evaluated included understanding of the following: diabetes fasting blood glucose (FBG) and HbA1c levels. The Hierarchical Linear and Nonlinear Modeling software (HLM-5) and univariate analyses of covariance were used.

The results revealed that a total of 128 individuals were given intensive diabetes education and compared with 128 controls. There was no significant difference identified between the groups initially. Hierarchical linear and nonlinear multilevel modeling was used so that participants with missing data were not eliminated. ANCOVA analysis was performed and the results on HbA1c levels at three months showed that the experimental group had a level of 10.64% versus 11.20% for controls  $p < 0.051$ , but at six months, the change was significant with the experimental group at 10.79% versus the control group at 12.21%,  $p < 0.001$ . They remained significant at twelve months with the experimental group at 10.87% versus 11.66% for the control group,  $p < 0.011$ . Similarly, FBG at three months was 187.88 for the experimental group versus 202.74 for the control group  $p < 0.038$ . At six months, the experimental group had FBG 184.15 versus 216.13 for control group,  $p < 0.001$ , and at one month, the experimental group had 193.72 versus 211.74 for the control group,  $p < 0.019$ . Diabetes knowledge score was higher for the experimental group at three months (41.70 versus 38.86),  $p < 0.001$  and at twelve months (43.15 versus 40.78  $p < 0.001$ ). Age and gender were not associated with any differences.

The findings revealed significantly better outcomes in the experimental group, such as lower HbA1c and fasting blood glucose levels, along with increased diabetes understanding. In their conclusion, the researchers advised that culturally competent education should be an important consideration in guiding national initiatives and recommended that more studies should focus on being aware of communication issues for non-English speaking populations and on finding ways to maximize the delivery of diabetes self-management in these groups.

Zamzam, *et al.* [23] conducted a qualitative phenomenological study to observe barriers to diabetes care in diabetic women in Syria. Recruitment procedures included a purposive sample of twelve middle-aged women who met criteria. The researchers used conventional content analysis to guide semi-structured interviews with the participants. The analysis of the data revealed three dominant themes: poor patient-healthcare provider relationship, inadequate education, and psychosocial problems. The first theme had two subthemes: relationship with nurses and relationship with doctors. Other themes were low self-efficacy, stress,

depression, maternal responsibilities, inadequate support, family, and work tasks. In addition, the first subtheme that emerged was the relationship with healthcare providers, including nurses and physicians. The second theme had no subthemes. The third theme had six subthemes: low self-efficacy, motherhood role, lack of social support, stress and depression, anxiety, and work and family responsibilities.

The results of this study highlighted the importance of focusing on specific goals to enable clients with diabetes to manage their disease better by promoting an improved relationship between clients and providers and ensuring social support in the treatment of psychosocial issues that occur with diabetes. The findings emphasized the importance and necessity of specific goals in assisting diabetic clients to manage their illness. This must be achieved by encouraging better relationships between patient and healthcare providers to ensure that diabetic patients receive the critical social support that is needed to help improve any related psychosocial problems with this illness.

Vaccaro, *et al.* [24] conducted a quantitative correlational study in South Florida. The researchers' objective was to examine the role of social support in the care of diabetes in minorities, including Haitian Americans (HA), Cuban Americans (CA), and African Americans (AA). The convenience sample included a total of 405 T2DM patients: 121 HAs, 174 CAs, and 110 AAs. Recruitment procedures included several modalities such as using a list from providers, university members, and diabetes educators from Miami-Dade and Broward counties in Florida, as well as a Knowledge Base Marketing Inc. Diabetes was confirmed for each participant with a laboratory result of HbA1c greater than or equal to 6.5% and a fasting blood glucose of greater or equal to 126mg/dl.

The Michigan Diabetes Research and Training Center (MDRTC) Diabetes Care Profile survey, a reliable and valid instrument confirmed for African Americans and Whites, was used. In addition, an abbreviated version of the MDRTC was also validated to be used as an instrument for Cuban American population. The functional social support (FSS) survey using a Likert scale was used to assess the participants' perception of family and friends support; the greater the scores, the more support was perceived by the subjects. In addition, from the MDRTC, DSM subscales were developed, and a self-rated health (SRH) was performed developed by the World Health Organization (WHO) all using Likert scales. Data analysis was performed with SPSS version 19.0 and determined a statistical significance of  $<0.05$  using ANOVA for continuous variables and post hoc analysis to determine the difference between which

groups. Chi-square was used for categorical variables, and Spearman's rho was used for correlational analysis and post hoc analysis. Using descriptive statistics with a multiple regression model, analysis was performed with covariates with the identification of the ethnic group and sex, marital, smoking and insurance status, diabetes education, number of years with diabetes, and SRH. The researchers also analyzed the significant interactions and covariates that were influenced by ethnicity and sex.

The researchers reported significant differences with regard to age among the groups; CAs were significantly older (65 +/-12.0) than HAs (58.4 +/- 9.9) and AAs (54.1 +/-10.4)  $p < 0.001$ . The Black subjects were less likely to report income, notably for CAs 9.1% ( $n = 16$ ), HAs 26% ( $n = 32$ ), and AAs 19.1% ( $n = 21$ ),  $p < 0.275$ . The researchers reported significant differences among subjects reporting no insurance status: CAs 14.9% ( $n = 26$ ), HAs 46.3% ( $n = 56$ ), and AAs 20.0% ( $n = 22$ ),  $p < 0.001$ . Wilks Lambda multivariate test was significant for differences among the groups. The authors reported significant differences among the ethnic groups for DSM and AIC, but there was no difference between the FSS scores. The results were for the FSS for CAs ( $M = 45.0$ ,  $SD = 7.8$ ), for HAs ( $M = 42.4$ ,  $SD = 9.2$ ) and for the AAs ( $M = 43.3$ ,  $SD = 11.3$ ),  $p < 0.73$ . The results were for the DSM for CAs ( $M = 59.1$ ,  $SD = 9.8$ ), for HAs ( $M = 64.7$ ,  $SD = 8.5$ ), and AAs ( $M = 59.5$ ,  $SD = 9.1$ ),  $p < 0.001$ . The researchers reported a significant difference with the HbA1c scores for CAs ( $M = 2.0$ ,  $SD = 20$ ), HAs ( $M = 2.09$ ,  $SD = 28$ ), and for the AAs ( $M = 2.00$ ,  $SD = .23$ ), which were analyzed on a logarithmic scale.

The FSS score was positively correlated with the DSM score (Spearman Rho 0.205;  $p < 0.01$ ), but the negative correlation with glycemic control (-0.030) as indicated by HbA1c was not significant. HAs had higher DSM scores (64.7 +/- 8 versus 59.1 +/- 9.8 and 59.5 +/- 9.1),  $p < 0.001$  and yet had poorer glycemic control raising the question about the effectiveness of DSM in this population. The researchers noted that after adjusting for insurance status and marital status, the ethnic difference in HbA1c was negated; why this adjustment for marital status was made was unclear. The researchers found that while they were not able to confirm cause and effect due to the cross-sectional methodology, the understanding of diabetes care among subjects who had social support to manage their health was important among all groups. The researchers recommended further research to reinforce the results.

The study by Nguyen and Edwards [21] illuminated key factors in caring for Vietnamese American diabetes patients and patients of similar descent by identifying barriers and facilitators of diabetes care that can inform health professionals in the management

of their diabetes clients. The study by Brown, *et al.* [22] conducted with Mexican Americans showed better outcomes with culturally competent DSME. The study by Zamzam, *et al.* [23] identified social support and psychosocial relationships as integral to the management of T2DM. Likewise, Vaccaro, *et al.* [24] also accentuated the need for social support among T2DM patients. These studies addressed the importance of cultural awareness when dealing with ethnically and culturally distinct groups. Research highlighting the cultural influences in HAW with T2DM may similarly impact the care of this unique population.

## Conclusion

This paper discussed the historical context of diabetes, including diabetes in Blacks, African American women, and Haitian American women. From the literature review, eighteen articles were included for their relevance to the phenomenon of type 2 diabetes in Haitian American women. Four distinct themes emerged from the search: historical context of diabetes in Haiti, diabetes in African American women, cultural factors in type 2 diabetes management, and adherence to treatment and management of type 2 diabetes. This review suggest that scant research exists with regard to HAW with T2DM and that culture plays an important role in the lifestyles of ethnically distinct and immigrant populations. T2DM continues to be a significant health and economic concern in the United States and around the world, with an increased incidence and prevalence of among all demographics, but with particular impact on the most vulnerable minority communities, including Haitian Americans.

## Author Contributions

Dr. Balkys Bivins conducted the literature review, Dr. Indra Hershorin and Dr. Anthony Umadhay reviewed this manuscript in preparation for submission to this journal.

## Acknowledgements

This work was in preparation of Dr. Balkys Bivins dissertation on the Lived Experience of Haitian American Women with Type 2 Diabetes. She wishes to thank her dissertation committee members: Dr. Indra Hershorin, Dr. Anthony Umadhay, and Dr. Diann Carr for their support and guidance throughout the dissertation process. Dr. Balkys Bivins conducted the literature review, Dr. Indra Hershorin and Dr. Anthony Umadhay reviewed this manuscript in preparation for submission to this journal. Dr. Balkys Bivins appreciatively acknowledges Sigma Lambda Chi Chapter for the financial support to conduct her study towards her doctorate in philosophy of nursing.

**Conflict of Interest**

No financial conflict exists.

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**Volume 2 Issue 4 April 2019**

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