A Review of Type 2 Diabetes Management Interventions Targeting Low Income Adults

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Abstract

Background: Type 2 diabetes is a prevalent disease among adults in the United States. The disease occurs because blood sugars are too high. In order to reduce blood sugar levels, efficacious interventions need to be implemented, specifically interventions with a behavioral component.

Purpose: The purpose of this review is to identify the similarities between behavioral diabetes management interventions among low-income adults that are effective in reducing A1C levels and examine the components that show improvement in glycemic control so that achievement of long-term glucose regulation is possible.

Methods: Studies had to be a behavioral diabetes management intervention targeting individuals older than 18 years old who have a low annual income with a pre-and post-test design conducted in the United States, be in the English language, include glycemic control, and published between 2015-2021 to be eligible for review. Six sources of evidence were found from searching Psych Info and PubMed and met all eligibility criteria.

Results: Results show that behavioral diabetes interventions that include goal setting and healthcare professionals are common components of interventions that reduce HbA1c levels. Health coaches and specific goal setting are the specific components that are effective in lowering blood sugar levels.

Conclusion: All successful interventions included healthcare professionals and most included goal setting to help lower blood glucose levels. Future studies should confirm these results using more studies in the review process. Ultimately, these results can help health promotion professionals create programs that assist low-income adults to achieve long-term glucose regulation.

Introduction

Type 2 diabetes is a large health problem in the United States that is associated with other chronic diseases and increased mortality. Type 2 diabetes occurs when a person's blood sugars, or blood glucose is too high. A pancreatic hormone called insulin helps move glucose into your cells. However, type 2 diabetes develops when the body produces too little insulin and too much glucose stays in the blood (National Institute of Diabetes and Digestive and Kidney Diseases, 2017). Many health problems arise when diabetes and blood sugars are poorly managed, such as kidney disease, foot problems, nerve damage, eye problems and heart disease (National Institute of Diabetes and Digestive and Kidney Diseases, 2017). Unfortunately, the prevalence of diabetes in the United States is high. In 2018, 10.5% of the entire U.S. population had diabetes, and 34.1 million people or 13% of all U.S. adults aged 18 years or older had diabetes (CDC National Diabetes Statistics Report, 2020).

Achieving recommended blood glucose levels is important to help manage diabetes. An A1C test monitors average blood sugar over three months (ADA, 2019). According to the American Diabetes Association (ADA) (2019) the recommended A1C, also called HbA1c, for adults is usually less than 7%, but some providers may suggest an A1C goal of less than 6.5%. To manage blood glucose levels, it is important to make lifestyle changes and see a healthcare provider regularly. Specifically, it can be important to engage in 150 minutes of physical activity per week and plan healthy meals that are balanced with carbs, healthy fat, and vegetables. These lifestyle interventions help a person with diabetes and also their weight management if they have overweight or obesity (National Institute of Diabetes and Digestive and Kidney Diseases, 2017; (CDC National Diabetes Statistics Report, 2020). Of people meeting A1C goals, 77.8% of them had a usual source of diabetes care like a doctor or other healthcare professional (CDC National

Diabetes Statistics Report, 2020). Due to the fact that these lifestyle changes help lower A1C, blood pressure, and cholesterol, greater glucose control may help with better diabetic and cardiovascular outcomes.

Still, certain groups are more prone to have poorer glycemic control. The highest prevalence rates for diabetes for U.S. adults aged 18 and older occur among American Indians/Alaska Natives (14.7%), people of Hispanic origin (12.5%), and non-Hispanic blacks (11.7%) (CDC National Diabetes Statistics Report, 2020). Blacks and Hispanic groups have the highest risk of complications and mortality (Gonzalez-Zacarias et al., 2016). This disparity is probably due to the fact that it has been shown that Hispanics are not as well educated on diabetes management and they tend to be less motivated to check their blood glucose levels (Gonzalez-Zarcarias et al., 2016). Low-SES groups, especially lower educated and low-income groups have had poorer outcomes. Specifically, decreased access to healthcare and resources affect the glucose levels of adult black Americans (Gonzalez-Zarcarias et al., 2016). In regard to gender, outcomes for achieving glucose regulation vary for men and women. Some studies have shown that men achieve better glucose regulation and other studies have shown that women achieve better glucose control. For example, women achieved a mean A1C of 6.24% while men had a A1C of 8.87% (Roy et al., 2016). However, in another study, men had better glycemic control (Gonzalez-Zarcarias et al., 2016).

Behavioral components of interventions that address improvement in glycemic control need to be explored further. Components of interventions focusing on peer support have been extensively studied (Afshar et al., 2019). Also, short-term improvements in glycemic control have been shown but improving long-term glucose control proves more difficult (Lynch et al., 2019).

The purpose of this review is to identify the similarities between behavioral diabetes management interventions among low-income adults that are effective in reducing A1C levels and examine the components that showed improvement in glycemic control so that achievement of long-term glucose regulation is possible. This review seeks to answer the following questions:

1. What do effective behavioral diabetes management interventions have in common?
2. What are the specific components of diabetes management interventions that successfully decrease A1C levels among low-income adults?

Understanding the components in behavioral diabetes management interventions that help achieve lower blood glucose levels will assist researchers and health promotion program planners to create effect interventions that can effectively reach long-term glucose regulation among low-income adults primarily Hispanics, or non-Hispanic Blacks.

Methods

This review aims to identify the similarities between behavioral diabetes management interventions among low-income adults and examine the components that showed improvement in glycemic control. There are a number of indictors that may be used to measure glycemic control which include HbA1c and glycated albumin. For this current review, HbA1c was the indictor of choice used as the primary outcome measure to assess glycemic control as it is the gold standard (Shimizu et al, 2019). Also, low-income was determined based on annual income whether it was household income or an individual's income.

Search Strategy

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework was used to assist the current review (see Figure 1 for flowchart) (Moher et al., 2009). Studies aimed to increase diabetes management through improvement in glycemic control

were identified by searching articles in Psych Info and Pub Med electronic databases. “Diabetes management”, “intervention”, “adults”, and “low-income” were the terms included in the searches. The years 2015-2021, English language, and peer-reviewed articles were selected to limit the searches. After the initial search, three phases occurred to identify studies for inclusion in the current review. First, titles of articles were reviewed in order to identify the relevant titles. Articles with relevant titles were further screened by reading the abstracts of these articles. The articles with relevant abstracts were pulled for full text review. Six studies met all inclusion criteria after full text review, and these studies were included to help answer the research questions.

Inclusion and Exclusion Criteria

Studies had to meet multiple criteria to be included in the review. The inclusion criteria in regard to study participants were having diabetes, being older than 18 years old, and having a low annual income. The studies also had to be a diabetes management intervention with a pre- and post-test design and with a behavioral component, include glycemic control as a measured outcome, be in the English language, and conducted in the United States. Additionally, studies were required to be published between 2015-2021. Studies were excluded if the study participants were children or adolescents, the study did not take place in the United States, and no behavioral component was a part of the intervention. Studies were excluded if income was not used as an indicator of SES or if glycemic control was not an outcome measurement. Any study failing to meet all inclusion criteria were excluded from the review.

Data Extraction and Synthesis

Relevant data and information were extracted from all full text articles that met all inclusion criteria. A data extraction table was used to organize and synthesize all the information

needed to answer the research questions. For each study, study citation, study design, population characteristics, intervention details, and intervention outcomes were included in the data table (see Table 1 for full data extraction table).

Results

After study duplications were removed, a total of 75 studies were initially screened for review. After reviewing titles and abstracts, 63 studies were identified as irrelevant and 12 studies underwent a full text review. Six out of the 12 studies meet all study inclusion criteria and were included in the results section. All studies were conducted in the United States and targeted diabetes management using a least one behavioral component. Additionally, all studies included adults who had low annual incomes. Five out of six interventions included trained professionals. One of the interventions had sessions that were led by health coaches, one had sessions led by Registered Dietitians (RDs), health coaches, and exercise consultants, one included a RD via telephone, one had sessions that were led by trained therapists, and one had education delivered by a RD (Willard-Grace et al., 2015; Moncrieft et al., 2016; Ahn et al., 2018; Lynch et al., 2019; & Wang et al., 2015). The intervention not led by trained professionals was led by lay workers (Baig et al., 2015). The length of the interventions lasted eight weeks to one year. Only one study that lasted less one year (Baig et al., 2015). Sample sizes for the intervention ranged from N=100 to N=441. All studies primarily had female, adult participants with their mean age between 51 and 56 years of age. Four studies' participants were primarily Latino or Hispanic (Willard-Grace et al., 2015; Moncrieft el al., 2016; Baig et al., 2015; & Wang et al., 2015). The two other interventions primarily included African Americans (Ahn et al., 2018 & Lynch et al., 2019).

Successful Intervention Studies

For this review, interventions were deemed successful if diabetes management improved through glycemic control in the intervention groups compared to the control groups. Glycemic control outcomes were evaluated using HbA1c, and interventions groups had to decrease their HbA1c from pre- to post-test to be considered successful. Five out of six interventions had success in decreasing intervention participants' HbA1c (Willard-Grace et al., 2015; Moncrieft et al., 2016; Ahn et al., 2018; Lynch et al., 2019 & Wang et al., 2015). HbA1c was decreased by as little as 0.3% and as much as 1.2% in these five interventions.

Four out of five of the successful interventions included goal setting for physical activity or diet. For diet, decreasing intake and portion size of high glycemic index foods were important in one intervention study (Wang et al., 2015). Another intervention goal for diet was a caloric intake goal based on participant's weight (Moncrieft et al., 2016). The Life intervention had a goal for participants to follow a diet that followed the American Diabetes Association guidelines (Lynch et al., 2019). For physical activity, one goal for an intervention was 150 minutes of physical activity per week (Moncrieft et al., 2016). Another intervention had an exercise goal of developing exercise plans for at home and at the facility where the intervention took place (Ahn et al., 2018).

Additionally, health professionals were used in all of the successful interventions. Two of the five interventions incorporated health coaching (Willard-Grace et al., 2015 & Ahn et al., 2018). One of them used health coaching before, during, and after medical visits (Willard-Grace et al., 2015). The other intervention included a one-on-one visit with a health coach for one hour every month (Ahn et al., 2018). Three of the five successful interventions included the help of RDs (Ahn et al., 2018; Lynch et al., 2019; & Wang et al., 2015). One of these interventions incorporated an initial one-on-one meeting for one hour followed by 30 min follow-up visits

once a month with the RD (Anh et al., 2018). Another intervention had RDs that led nutrition education sessions (Lynch et al., 2019). The third intervention included RDs who randomly telephoned participants to administer a 24-hour food recall (Wang et al., 2015). The fifth successful intervention had sessions led by trained therapists (Moncrieft et al., 2016).

Unsuccessful Intervention Studies

One intervention was identified as unsuccessful (Baig et al., 2015). This intervention implemented a community-based approach by partnering with two catholic churches, a catholic social service agency, healthcare leaders, and community members. The partnership was called Little Village Community Advisory Board. Ninety-minute groups sessions took place once a week for eight weeks and were led by lay workers. During these sessions, participants learned about goal setting, how to make healthy Mexican dishes, and how to exercise at home without special equipment (Baig et al., 2015). The HbA1c of the participants in the intervention group only increased at the three-month follow-up. There was not a decrease by 6 months and there were no significant differences between the intervention and control groups for HbA1c (Baig et al., 2015).

Discussion

The purpose of this review was to identify the similarities between behavioral diabetes management interventions among low-income adults that are effective in reducing A1C levels and examine the components that showed improvement in glycemic control. Specifically, the study aimed to identify the common components of behavioral diabetes management interventions that lowered HbA1c levels among low-income adults. Four out of 5 of the successful interventions included goal setting and all of the successful interventions included healthcare professionals. Components that led to a decrease in HbA1c levels included specific

goal setting and health coaches. Understanding the similarities among successful diabetes management interventions and the components that make up the interventions that lead to a decrease in blood sugars will help future diabetes management interventions and programs to use the most appropriate components that will help lower A1C levels in the long term among low-income adults.

Commonalities of Effective Interventions

Goal Setting

Four out of five of the studies used goal setting with the participants. Goals were related to behaviors like diet and exercise. However, no comparison can ultimately be made between goal setting and non-goal setting interventions as only one intervention in this review did not include a goal setting component. Also, the one intervention that was not successful did include goal setting among other components. Still, these goal setting findings relate to a study on the effectiveness of goal setting in regard to lowering HbA1c (Fredrix et al., 2018). In a meta-analysis that focused on 12 interventions, goal setting was found to lower HbA1c. Like the interventions in this review study a small change in HbA1c was also seen in the meta-analysis that focused on goal setting in regard to diabetes management. This similarity with the meta-analysis study should be consider with caution as the populations and methods are not exactly the same. Future review studies should consider including more interventions that do not include goal setting to confirm that goal setting is an optimal component.

Health Professionals

All successful interventions included health professionals that helped deliver the interventions in some form whether it was through education, goal setting, or tracking and measuring outcomes. Participants in these interventions that included healthcare professionals all

showed a decrease in HbA1c whereas the one unsuccessful intervention included lay people who delivered the program and did not show a decrease in blood sugar levels at posttest. Specifically, improvements were shown at 3 months but were not sustained in the unsuccessful intervention. The results of this review study are consistent with past research. It has been shown that HbA1c has not be sustained in interventions led by lay leaders (Rosal et al, 2011). It is important to include healthcare professionals in programs to reduce blood sugar levels. Specifically, certified diabetes educators (CDEs) should be employed to help manage diabetes (Burke et al., 2014; AADE, 2018). The studies in this review that utilized healthcare professionals did not specify if any were CDEs, but future studies should include healthcare professionals like health coaches or RDs who are also CDEs.

Specific Components Contributing to lowered HbA1c levels

Specific Goal Setting

The successful interventions in this review that used goal setting specifically utilized specific goal setting. Goals were centered around behavior change related to diet and exercise. Past research shows that setting specific goals that relate to behaviors that will lead to a decrease in blood sugar levels, such as exercising for 150 minutes per week or eating according to the American Diabetes Association guidelines better help to decrease HbA1c levels than just listing a broad goal, such as “reduce HbA1c” (Fredrix et al., 2018). Future programs should continue to set specific goals related to lowering blood sugars.

Health Coaches

Additionally, interventions that included health coaches showed larger decreases in HbA1c levels. Health coaches are healthcare professionals who use goal setting as a primary tool to change behaviors. Other research is consistent with these results as even a shorter intervention

of 6 months utilizing health coaching showed a 0.68% decrease in HbA1c levels (Chen et al., 2019). Future research may want to consider the specific components of health coaching that impact blood sugar levels among low-income adults since goal setting is not the only aspect of health coaching.

Health Promotion Implications

The current review adds to the existing literature that effective behavioral interventions promote A1C control in low-income adult populations. The findings suggest that interventions that include goal setting and health professionals, specifically health coaches that help people with diabetes set specific goals will benefit this population. Interventions that lower A1C levels will aid in the management of diabetes so that low-income adults will have better diabetic outcomes. These interventions may also help reduce the risk of diabetic complications like heart and kidney diseases. Interventions that include these components to target low-income adult populations will also help limit health disparities. Future health promotion professionals, interventionists, and planners can use these findings to create programs that will effectively lower blood sugar levels and sustain lower A1C levels in adult clients with type 2 diabetes.

Strengths and Limitations

The main strength of the current review is the questions that formed the review. Many aspects of diabetes management and their effects on glycemic control have been studied previously. However, few studies have examined the specific components of behavioral interventions that have impacted diabetes management. In the realm of health promotion and public health, behavioral interventions are key to impact health outcomes, so it is imperative to know components of these interventions that\ create the most positive change. This review ultimately highlights the components that contribute to the decrease of HbA1c levels among low-

income adult populations. The main limitation to the current review is the lack of behavioral diabetes management interventions reviewed as well as the lack of interventions that included lay workers or leaders. Five of the six interventions included health professionals while only one included lay workers who implemented and assisted in the health intervention. Although it seems that healthcare professionals do in fact assist in lowering blood glucose levels, it is important to confirm that other interventions without health professionals do not lower A1C levels to ensure that future interventions primarily include health professionals. Another limitation is the generalizability of these results. These results may not be generalizable to populations that are not low-income nor adults with an average age around 55 years old. Also, most of the participants in the interventions were female, so these results may not be generalizable to male populations.

Conclusions

Findings from the current review show that interventions which include goal setting and health professionals, specifically health coaches that set specific goals with individuals with diabetes may be effective in decreasing HbA1c levels among low-income adult populations. Understanding the components that effectively decrease blood glucose levels will help improve long-term glucose control and diabetes outcomes. Decreasing blood sugar levels may help decrease the likelihood of diabetes worsening and other negative health conditions developing. Overall, low-income adults may see a better quality of life and live longer. Next steps should include further analysis of behavioral diabetes management studies to confirm these results so that new interventions may be developed to improve long-term glucose control among low-income adults.

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low-income patients: A randomized controlled trial. Annals of Family Medicine, 13(2), 130-138. https://doi.org/10.1370/afm.1768

Tables and Figures

Figure 1: Prisma Flow Chart for the Current Study

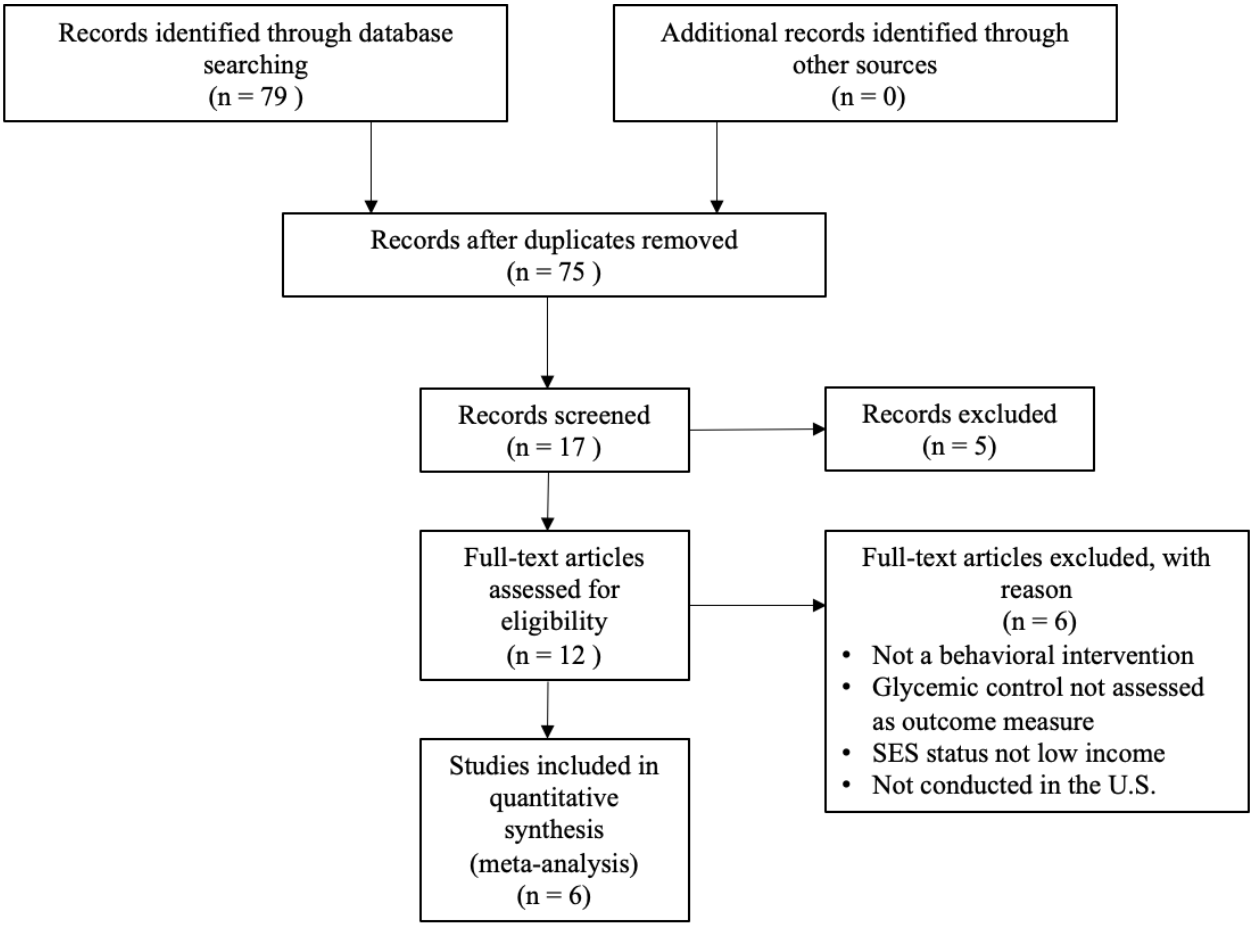
Records identified through database searching
(n = 79)
Additional records identified through other sources
(n = 0)
Records after duplicates removed
(n = 75)
Records screened
(n = 17)
Records excluded
(n = 5)
Full-text articles assessed for eligibility
(n = 12)
Full-text articles excluded, with reason
(n = 6)
• Not a behavioral intervention
• Glycemic control not assessed as outcome measure
• SES status not low income
• Not conducted in the U.S.
Studies included in quantitative synthesis (meta-analysis)
(n = 6)

Table 1: Data Extraction Table for Interventions

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
Willard-Grace et al., 2015	Health Coaching by Medical Assistants	RCT	N = 441 18-75 years M age = 53 years 55.3% Female 70.1% Latino M BMI = 31.4 SES = Household Income	12 months	Health Coaching Intervention Group (n=224) A total of three health coaches who were female and bilingual in Spanish and English received 40 hours of health coach training. Two coaches were placed at site A and one health was placed at site B. Patients received 12 months of health coaching. The coaches met with the patient before the visit, remained in the examination room during the visit, reviewed the care plan with the patient immediately after the visit, and followed up	Collected at baseline and 12 months HbA1c - measured using the NGSP-certified DCA Vantage point-of-care testing system (Siemens) Health coaching arm was more likely to achieve goals than usual care. About twice the proportion of participants in the health coaching group achieved the outcome goal for HbA1c of 8.0% or lower. HbA1c decreased by 1.2% from baseline to 12 months Compared to site B, larger improvements occurred at site A. It was reported that the quality of coaching was better at site A. At site B, there were less patient and coach interactions, lower trust in the health coach

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
					with patients in between visits in person and by telephone. Health coaches were assigned 100 patients, contacted them at least once a month, and met with them in person at least once every 3 months. Usual care (n =217) Patients had access to resources at the clinic.	reported, and the health coach at that site was absent for more than 8 weeks of the study. She reported difficulty implementing health coaching topics.
Moncrieft et al., 2016	Community Approach to Lifestyle Modification for Diabetes (CALM-D)	RCT	N = 111 18-70 years M age = 54.81 years 71.2% Female 84.7% Hispanic M BMI = 32.6	1-year intervention	Intervention group (n=57) 17-sessions took place and each session lasted 1.5-2 hours. Trained therapists administered each session. First, two individual sessions occurred followed by two weekly and four biweekly group sessions. The remaining nine sessions took place once a month.	Outcomes = weight, glycemic control, and depressive symptoms Body weight – Tanita Body Composition Analyzer Depression symptoms – BDI-II Glycemic control – HbA1c and cystatin Renal Function – creatinine and cystatin C

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
			SES = Household Income		To accommodate participants' schedules, sessions varied from taking place early morning, evening and on weekends. Because of participant's schedule, some participants had more individual sessions than others. Sessions consisted of diet and physical activity topics and cognitive behavioral and social learning theory to address depression. Each participant had a weight loss goal of 7% of initial body weight, a physical activity goal to reach one's weight loss goal of 150-minute aerobic activity/week, and caloric intake goal based on initial body weight. Therapists recommended food choices and brisk	Assessments were taken at baseline, 6 months, and 12 months. Laboratory results were completed at all assessment time periods. Only 25% completed the entire intervention and 51% completed less than 7 sessions. Intervention group had a decrease in weight of 1.22kg, 24% of participants achieved at least 5% of weight loss. Only 11% of control participants did so. Glycemic control – Intervention group showed an overall decrease in HbA1c compared to control. Over the first 6 months participants in the intervention showed a .07mmol/mol decrease per month on HbA1c. Participants that completed 7 or more session

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
					walking to achieve goals. A scale and materials to record and monitor food intake was provided, strategies to address depressive symptoms were included. Strategies for exercise and dietary goals were learned and implemented during the first 6 months, while the last 6 months focused on problem solving and maintenance. Usual care control (n=54) – received a short educational manual covering topics on diabetes management	decreased their HbA1c by 0.53% Those who completed less than 7 session (16 participants) gained .5kg and increased HbA1c by 0.35%.
Baig et al., 2015	Picture Good Health/Imagínate una Buena Salud	RCT Pilot Study	N = 100 English or Spanish	8 weeks	CBPR approach used by partnering with two catholic churches, a catholic social service	Outcomes = A1c and direct LDL collected by venipuncture

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
			speaking Latino adults >18 years old M age = 54 years 81% Female M BMI = 31.7 SES = Household Income		agency, healthcare leaders, and community members, called Little Village Community Advisory Board (CAB) Church-based intervention group - Eight weekly, 90-minute group classes took place at the two churches and were led by lay workers. Classes included nutrition and physical activity information based on self-determination theory. Goal setting, identifying barriers, and identifying behavioral alternatives were included. For diet and exercise, participants learned healthy traditional Mexican recipes and exercises that could be done at home without special equipment. Other components included photovoice and	Assessments took place at baseline, 3 months, and 6 months. At 3 months, both groups decreased their A1c. This change in A1c was not sustained at the 6-month follow-up. No significant difference between intervention group and usual care group for LDL. In the intervention group, diet and exercise improved at the 6-month follow-up compared to usual care group. The intervention group reported to be less likely to eat high-fat foods and more likely to participate in exercise compared to the usual care group.

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
					participants were told of church-sponsored exercise programs they could attend. Modeling and rehearsing target behaviors to increase self-efficacy were used by lay workers through mock lessons, group discussions, and coaching. Each class began with a prayer. Usual care group - One 90-min diabetes lecture	
Ahn et al, 2018	Church Health Center's Diabetic Obesity Weight Loss Pilot Program-Health Living	Treatment group and retrospective comparison group with pre-test and post-test	N = 149 21-60 years M age = 51 81% African American	12 months	First, participants had to watch 6 basic diabetes educational sessions to be allowed to do the program. Each one was one hour long and led by a Registered Dietitian. The classes included topics on goal setting, definition of diabetes, exercise and stress, and	Primary outcomes = BMI and HbA1c which were clinically measured Assessments obtained at baseline, 3 months, 6 months, 9 months, and 12 months. Post-test given at 18 months

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
			74.8 % Female M BMI = 36.2 SES = Household income		knowledge about nutrients, carbohydrate counting, and medications. Realistic goals were set following the sessions and three components were implemented. 1. Health coach visits: One hour visit at least once a month to set realistic goals 2. Registered dietitian visits: An initial ono-on-one meeting for one hour followed by 30 min follow-up visits once a month 3. Exercise consultations A weekly visit via telephone to discuss exercise plans and 30-45 min exercise consultations on site to take weight and develop plans for exercising at	From baseline to last follow-up, BMI decreased 2.1%. and Hemoglobin A1c decreased by 0.6% from 8.3% to 7.7%. Treatment groups decreased HbA1c by 0.07% on a monthly basis. Control group participants increased their HbA1c by 0.1%. Changes in BMI and HbA1c found to be related to Registered Dietitian visits. Each dietitian visit decreased HbA1c on average by 0.08%, and BMI by 0.07 kg/ m2.

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
					the facility and at home every 3 months Total sessions = 28 on-site meetings (12 with RD, 4 with exercise consultant, and 12 with health coach Goal setting was individualized using SMART goals Control group = Church Health medical clinic patients who were eligible for the intervention but declined to participate (outcomes collected from EMR)	
Lynch et al., 2019	LIFE	RCT	N=211 ≥ 18 years old M age = 55 years 70.1% Female	12 months	Intervention group - 28 group sessions led by a RD in a community setting with peer supporter phone calls included Sessions focused on diet and were weekly for the first four months,	Primary outcome = A1c at 12 months Short assessment conducted at 6 months with full assessments conducted at 12 and 18 months At 6 months, A1c decreased more in

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
			Median BMI = 34.7 African American SES = Household income and uninsured		biweekly for the second four months, and monthly for the last four months. Groups included 15 – 20 patients and four components. 1. Culturally tailored diabetes nutrition education delivered by a RD 2. Physical activity 3. Self-monitoring of blood glucose (SMBG) 4. Social support (peer supporters telephoned participants the same amount of time as the sessions) Sessions included nutrition education, a physical activity, a healthy snack, and a group discussion about goals, progress, and barriers to behavior	intervention group than control group but were sustained by 12 months and 18. Control group also decreased A1c from baseline to 6, 12, and 18 months. Decrease in A1c by intervention group was always more but only significant at 6 months. HBA1c decrease by 0.4% at 18 months.

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
					change. During each session, participants set behavioral goals related to diet and physical activity. Logs and pedometers were used to monitor the behaviors. RDs helped tailor participants diets to blood glucose levels. Control group = 2 DSME groups session taught by a RD in first 6 months which is the standard of care Both groups learned about eating healthy, being active, monitoring, medication, problem solving, reducing risks and healthy coping.	
Wang et al., 2015	The Latinos en Control	Secondary data analysis from RCT	N = 238 Latino Adults Age = ≥ 18	1 year	Groups-based sessions that took place in a community setting 12 weekly sessions followed by 8 monthly sessions	Outcome measure = HbA1c and dietary measures Measures collected at baseline, 4 months, and 12 months.

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
			Mean age = 56 years 87.7% Puerto Rican 77.3% Female 77.9% Obese SES = Annual income		Glucose self-monitoring, diet, and physical activity topics were included. For diet, decreasing intake and portion size of high glycemic index foods were important. Participants received a set of measuring cups and spoons as well as a guide to types of glycemic index foods and their portion sizes. Group sessions included educational videos discussions, activities, and a brief coaching segment to set goals and problem solve. Taste tests of healthy foods, practice of healthy cooking methods for ethnic foods, label reading, a supermarket tour, measuring skills for cooking and portion	Dietary measures – RD randomly telephoned participants to administer a 24-hour dietary recall Glycemic load and HbA1c were associated. A one-unit change in glycemic index was associated with a 0.3% change in HbA1c.

Citation	Intervention/Study Name	Study Design	Population, SES indicator	Length of Intervention	Detailed Description of Intervention	Outcomes
					control during group meals, and strategies to incorporate new cooking methods at home were the activities incorporated. Usual care from primary care providers with no additional intervention	