# ASSESSING THE EFFECTIVENESS OF CULTURALLY SPECIFIC DIABETIC MANAGEMENT PROGRAMS WITHIN PRIMARY HEALTH CARE SETTINGS: A REVIEW OF THE LITERATURE

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## Abstract

**Introduction:** Diabetic management programs play an important role in supporting people who live with diabetes and preventing diabetes related complications. These programs need to be culturally relevant to be successful.

**Aim:** To explore culturally specific diabetic management programs within primary health care settings that can be adapted to the context of Qatar.

**Method:** This literature review was guided by Cronin et al.'s (2008) framework and included 17 scholarly articles published between 2011 and 2021. The Mixed Method Appraisal Tool was used to critically appraise the quality of these articles.

**Results:** The main components of culturally specific diabetic management programs are information and understanding, cultural norms, cultural interventions, and personal motivation.
Discussion: In order to ameliorate diabetes management for clients, culture needs to be considered when providing education.

**Key terms:** Diabetes, cultural, self-management

## Introduction

Diabetes Mellitus (DM) is a metabolic disease caused by a high glucose level in the blood. DM occurs when the body becomes resistant to insulin or when it produces little or no insulin. Serious health problems such as retinopathy, nephropathy, neuropathy, and cerebrovascular diseases may occur due to increased glucose levels in the blood over a long period of time (Mehring et al., 2017). Within the health care field, it has been noted that DM remains a primary health challenge (Al Busaidi et al., 2019). Globally, the prevalence of DM is increasing. The number of people who live with diabetes has quadrupled worldwide in the previous three decades, and DM is considered the ninth leading cause of death (Zheng et al., 2018). Farinha et al. (2020) mentioned that the number of people who live with diabetes had risen to 463 million people worldwide in 2019. These researchers mentioned that this number is expected to continue to reach 578 million by 2030 and a further 700 million by 2045. In 2019, it was estimated that 19.3% of people between the ages of 65 and 99 years will have diabetes, and it is projected that the number of people older than 65 years with diabetes will be 195.2 million by 2030 and 276.2 million by 2045 (Sinclair et al., 2020).

When caring for a person who lives with diabetes, it is important to note that diabetes can happen to anyone and people with diabetes may come from many diverse backgrounds. Therefore, culturally specific diabetic management programs (DMP) are an essential determinant of care. It is key for healthcare providers to understand the influence culture has on personal health care practices and how to encourage self-efficacy. A person's health and cultural beliefs should be considered to improve the quality of life for those who live with diabetes. Positive health behaviour changes that are aimed at reducing diabetes related complications cannot be forced upon people. It is imperative that the health care provider understands how culture guides individual behaviours, and gets insight not just from the person with diabetes but also from the family involved in the care. Therefore, this literature review aims to assess the effectiveness of culturally specific diabetic management programs that are being employed in other countries within primary health care settings to determine an approach that may be used in Qatar.

## Methodology

The process used in guiding this project was a literature review. The purpose of selecting Cronin et al.'s (2008) model for a literature review was to provide a comprehensive search for background and recent literature related to the use of culturally specific Diabetes Management Plans (DMP) within primary health care.

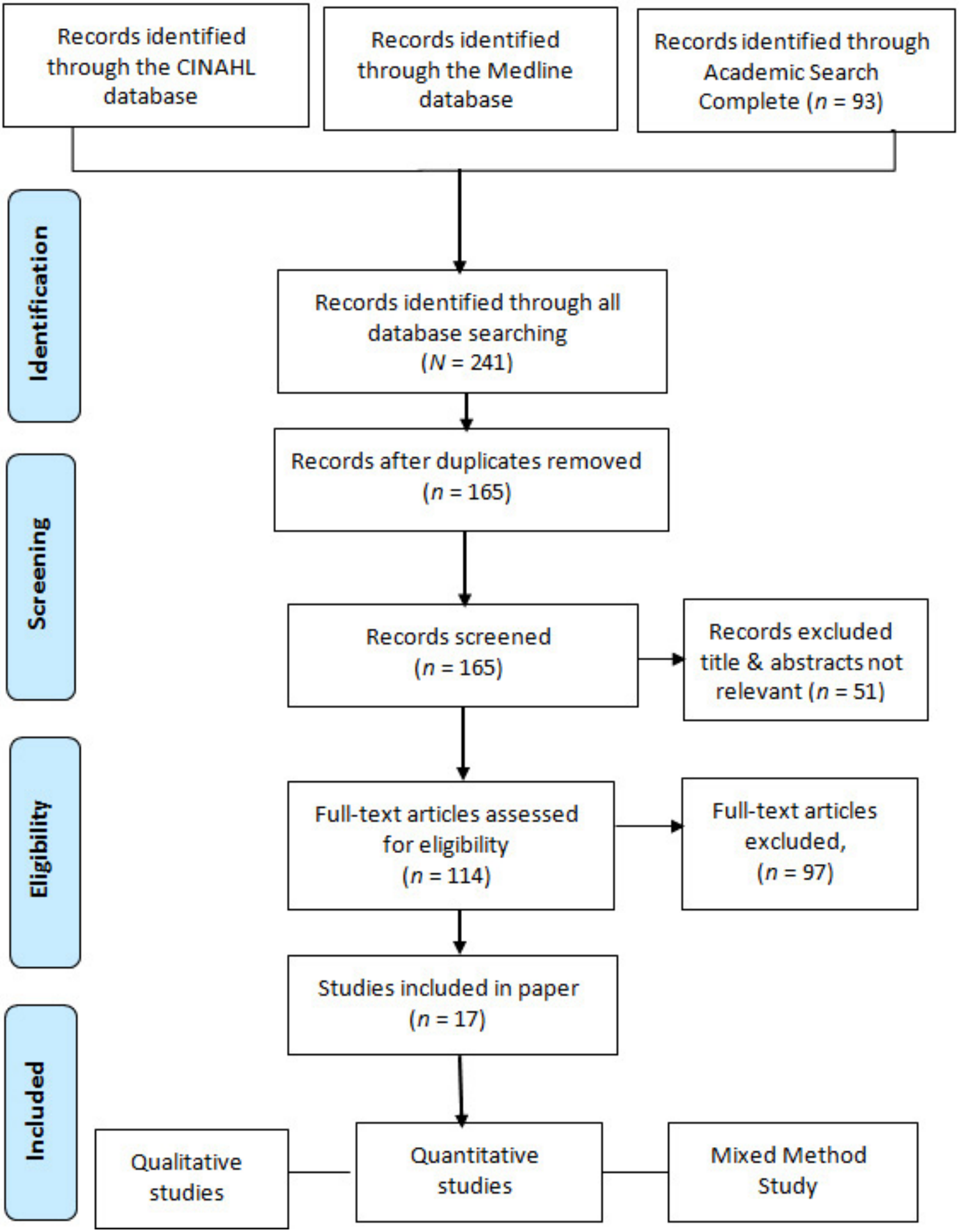
## Literature Search

The databases used in this review were Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, and Academic Search Complete. These databases were used to assess the cultural interventions in DMPs within primary health care settings worldwide. The following search terms were used in the literature search: diabetes*, Glycemic, manag*, self-manag*,prevent*, control*, education*, care*, self-car*, Awarene*, support*, N4 program*, Diabetes-Program*,Diabet*-management-Program, community health", "community care", "primary healthcare", "primary health care", "primary care", "Health Center*", "public healthcare", and cultur*. The Boolean operators AND and OR were used to identify and search for literature. The search outcome was restricted by using search limiters. These limiters were peer-reviewed, English language, and published between January 2011 and December 2021. The search resulted in 53 articles from CINAHL, 95 articles from Medline, and 93 articles from Academic Search Complete.

### Data Evaluation

241 articles were evaluated to find the most suitable literature to be used in this project. Seventy-six of these articles were removed because of duplication. The title and abstracts of the remaining 165 articles were reviewed according to inclusion and exclusion criteria. The inclusion criteria were (a) adult patients above 18 years old, (b) studies from 2011 to 2021, (c) studies about culturally specific DMPs within primary health care, (d) articles written in English, and (e) peer-reviewed articles. The exclusion criteria were (a) studies older than 10 years, (b) studies involving those under 18 years of age, (c) studies within hospitals or long-term care, (d) articles not written in English, and (e) articles that were not peer-reviewed. Fifty-one articles were excluded after reviewing the titles and abstracts. The full text was reviewed of the remaining 114 articles to find articles that assessed culturally specific DMPs in primary health care settings worldwide. The final review provided 17 articles acceptable for inclusion in this project (see Figure 1).

**Figure 1: Literature Search Flow Diagram**



### Data Appraisal

This project used the Mixed Methods Appraisal Tool (MMAT) version 2018 to evaluate the 17 studies. Three of these studies were qualitative in their design, seven of these studies were mixed methods in their design, and seven of these studies were quantitative design. All of these studies met all five of the required criteria.

### Data Analysis

Data from the 17 articles was organized and summarized in an extraction table to facilitate the analysis of the data. The 17 articles were presented in alphabetical order according to the authors' names. The table includes the title, authors' names, year of publication, country, study purpose, method, design, sample size, type of cultural interventions, results, and recommendations. This extraction table helped in providing data, exploring similarities and differences, comparing and highlighting results, and synthesizing the related information to find the common themes among these articles. Four common themes that emerged from these articles are information and understanding, cultural norms, cultural interventions, and personal motivation. The four themes that emerged through this process will be presented in the results section.

## Results

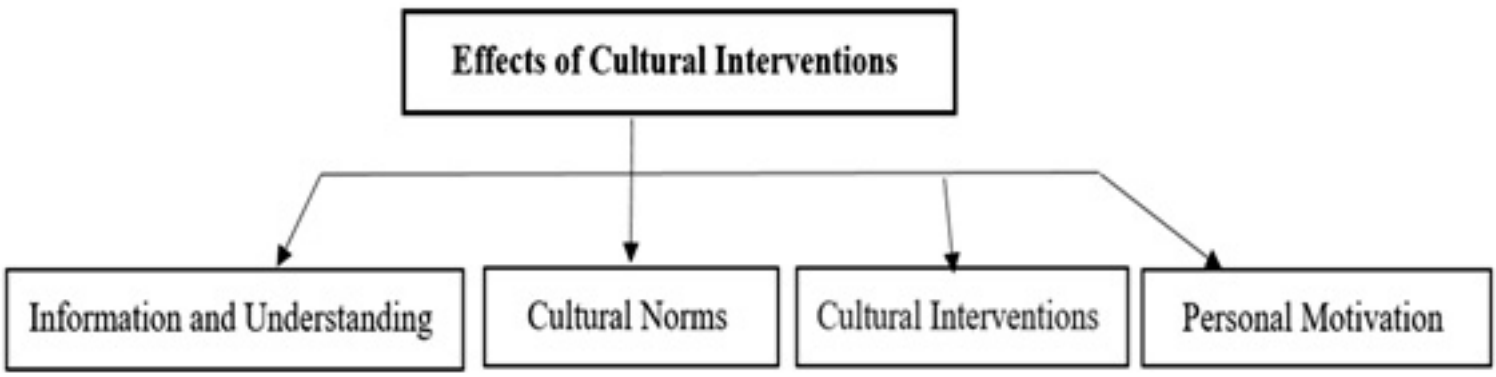
The 17 retrieved studies were primary studies that included three approaches: qualitative, quantitative, and mixed methods. These studies were conducted in different countries: Australia (n = 1), China (n = 2), Guatemala (n = 1), The Netherlands(n = 2), Qatar (n = 1), United Kingdom (n = 1), and United States (n = 9). These studies used different types of designs. There were three qualitative studies including phenomenological, case study, and grounded theory approaches. Brunk et al. (2017) used the phenomenological approach to evaluate the viability of a patient-centred educational intervention for T2DM self-management for Hispanic people. Dragomanovich and Shubrook (2021) used the case study approach to focus on health disparities that occur among people who live with diabetes. Kohinor et al. (2011) used the grounded theory approach to discover the sociocultural aspects affecting the dietary behaviours of Hindustani and African Surinamese immigrants with T2DM living in the Netherlands.

There were seven quantitative studies, including three randomized controlled trials, two quasi-experimental studies, one cohort study, and one descriptive study. These studies assessed the efficacy of culturally specific diabetic management programs. Four of these studies assessed the effectiveness of culturally specific diabetic educational programs on knowledge, attitude, and practice methods among people who live with diabetes (Choi & Rush, 2012; Mohamed et al., 2013; Ockene et al., 2012; Yin et al., 2018). The other three quantitative studies found improvement in glycemic control levels among people who live with diabetes by using a culturally specific diabetic educational program (Brown et al., 2021; Flores-Luevano et al., 2020; Le et al., 2013).

There were seven mixed methods studies. Flood et al. (2017) assessed a home-based diabetes self-management intervention program in rural Guatemala. Goff et al. (2021) assessed the suitability of healthy eating and an active lifestyle program for T2DM self-management education and support for Black-British adults. Ho et al. (2021) defined the development and feasibility of integrative nutritional counselling for Chinese Americans with T2DM. Seear et al. (2019) evaluated a locally adapted community-led diabetes prevention program with local young Aboriginal facilitators. Valen et al. (2012) provided a culturally related diabetes education program to Hispanic people. Weber et al. (2020) assessed the possibility of a cultural diabetes prevention program in the southern USA. Nicolaou et al. (2014) defined the development of a lifestyle intervention program that aimed to prevent diabetes in Surinamese adults living in the Netherlands.

Several types of cultural intervention programs were identified in the 17 articles included in this review. These programs impact people who live with diabetes, their families, health care providers, and entire organizations. The impacts of these programs were classified into four themes: (a) information and understanding (b) cultural norms (c) cultural interventions, and (d) personal motivation (see Figure 2).

**Figure 2: Identified themes**



### Information and Understanding

Compliance with the management of diabetes is better in patients with correct knowledge about diabetes. Participants in studies included in this review demonstrated improvements in knowledge-related diabetes and selected self-care activities during interventions (Flood et al., 2017; Flores-Luevano et al., 2020; Goff et al., 2021; Mohamed et al., 2013). Valen et al. (2012) delivered 28 hours of education focused on basic diabetes awareness and self-management strategies to participants in their study. These researchers found that this education improved their participants' diabetes awareness. Brunk et al. (2017) provided a diabetes-related educational program for a T2DM Hispanic population about dietary choices, self-glucose monitoring, and physical activity. These researchers found that their participants became satisfied with and interested in making lifestyle changes related to their cultural norms. Seear et al. (2019) assessed an 8-week cultural intervention program focusing on the causes and consequences of diabetes, practical activities, and stress management. Participants in this study reported that they increased their knowledge which led to changes in behaviours including shopping choices, eating more vegetables and low-fat foods, drinking more water, and avoiding soft drinks.

The main elements of a program may deliver important information in a way participants understand and may ensure programs are culturally appropriate and enjoyable. Brown et al. (2021) used a culturally appropriate diabetic education program to improve glycemic control in lower socioeconomic level Hispanic and Latino people who live with diabetes. These researchers found that empowerment and knowledge scores enhanced from baseline, which suggests that participants were involved in the content. Dragomanovich and Shubrook (2021) helped people who live with diabetes to register for a diabetic education session with a Spanish-speaking diabetes educator to improve diabetes treatment through cultural competency. These researchers found that this program allowed people who live with diabetes to continue eating a culturally important diet while still doing healthy modifications to reach the glycemic control level. Ho et al. (2021) showed the development and feasibility of an integrative nutritional counselling program based on the nutritional curriculum for Chinese Americans living with diabetes using the Chinese language, different colours of vegetable pictures, and Chinese food. These researchers found that their participants were satisfied with gaining new information that improved their dietary health habits and decreased their weight.

### Cultural Norms

This review identified several cultural norms that were seen as barriers to success in diabetic maintenance (Choi & Rush, 2012; Flood et al., 2017; Kohinor et al., 2011; Nicolaou et al., 2014; Weber et al., 2020). These cultural norms had a major role in influencing how people who live with diabetes managed their diabetes. Cultural norms which were seen as barriers were considered the biggest challenge for people when managing diabetes. Some of these barriers relate to gender roles (Weber et al., 2020), hospitality and identity (Kohinor et al., 2011), diet management (Choi & Rush, 2012; Flood et al., 2017; Nicolaou et al., 2014; Weber et al., 2020), beliefs about behaviours (Kohinor et al., 2011), and physical activity (Nicolaou et al., 2014). Weber et al. (2020) found that culturally prescribed gender roles impact the lifestyle behaviours of people who live with diabetes. As a result, they prioritize their family's life requirements rather than their health. Men in Weber et al.'s study worked on the land, saved money for the family, and left little time to exercise. Women in their study took care of their families and made their traditional food with little consideration for managing their diabetes. Kohinor et al. (2011) found hospitality and identity were important cultural norms that presented as barriers to following dietary guidelines in different societies. These researchers found that Surinamese people provided high-fat foods to their guests because these foods were considered as being an important component that added a specific flavour to Surinamese dishes. Surinamese people found it hard to change this behaviour because it was closely linked to their feelings of and identity in being Surinamese.

Some people who live with diabetes cannot manage their dietary requirements because of their cultural dietary preferences. Nicolaou et al. (2014) mentioned that using different ingredients, such as brown rice, or using different ways of providing food were noticed as negatively affecting the flavour of food. Weber et al. (2020) found that women were unable to use less oil in food preparation, mainly on social occasions, and efforts to lower fat or sodium were often met with resistance. Choi and Rush (2012) and Flood et al. (2017) found that Korean immigrants and largely rural and Maya indigenous populations often had fewer chances offered to people who live with diabetes to gain the required abilities and information to effectively self-manage diabetes. Kohinor et al. (2011) found that their participants expressed a behavioural belief that Surinamese people used bitter herbal therapies as treatment for diabetes. Participants in Nicolaou et al.'s (2014) study reported that physical activity is not encouraged within their communities. They explained that physical activity was culturally acceptable for men, while women were culturally not involved in activities outside the home. Spending time to exercise was considered by these participants as interfering with other, more important social responsibilities.

### Cultural Interventions

This literature review showed that the use of culturally specific education and activities must be included for the success of DMPs. Culturally specific DMPs in this review used different facilitators which included using a native language (Ockene et al., 2012; Valen et al., 2012), providing dietary health education (Brunk et al., 2017; Choi & Rush 2012; Ho et al., 2021), family engagement (Dragomanovich & Shubrook, 2021; Nicolaou et al., 2014), group discussions (Brown et al., 2021; Choi &

and Rush's (2012) study found that food can be modified to a lower glycemic diet. Brunk et al. (2017) found that several strategies were presented to their participants to use fiber, fats, vinegar, and cinnamon in traditional Mexican food. Choi and Rush (2012) found other cultural interventions included diet management for traditional Korean food, counting the number of calories and carbohydrates, and gaining information on familiar food by nutrition label reading and carbohydrate counts. Choi and Rush's program provided advice for the adjustment of traditional food, demonstrated healthy food choices, and provided cooking instructions.

Family engagement plays an important role in culturally specific DMPs and activities to promote diabetes health conditions. Dragomanovich and Shubrook (2021) and Nicolaou et al. (2014) found that dieticians provided a family meeting at the participants' homes to encourage the families to support the individual participants in reaching dietary goals. These participants were provided group cooking classes to increase their self-efficacy and to learn skills for modifying traditional dishes to follow dietary advice. Brown et al. (2021) and Choi and Rush (2012) found that participants were encouraged to participate in group practical activities and engage in discussions that promoted a better understanding of diabetes, complications, risks, and treatment. Participants in Seear et al.'s (2019) study reported that they gained new information regarding exercise, outside cooking, and stress management. Stress management included 30 minutes focused on physical activity and practical skills for healthy eating. Goff et al. (2021) found that culturally sensitive self-management education and support programs provided physical activity classes. These classes had instructors who provided exercises in five sessions, including resistance band training, circuit training, and cardiorespiratory exercises, such as Zumba, dance aerobics, and walking groups.

### Personal Motivation

Many studies reported the importance of personal motivation for the participants in educational programs (Brown et al., 2021; Brunk et al., 2017; Dragomanovich & Shubrook, 2021; Ho et al., 2021; Kohinor et al., 2011; Mohamed et al., 2013; Nicolaou et al., 2014; Seear et al., 2019; Valen et al., 2012; Weber et al., 2020; Yin et al., 2018). Brunk et al. (2017) found that new awareness by the participants regarding blood glucose levels and variations in blood glucose was effective in motivating their behavioural changes during their cultural self-management educational course. Ho et al. (2021) found that integrative nutritional counselling programs provided a feeling of respect for the traditional culture. Kohinor et al. (2011) mentioned that culturally sensitive diabetes education should address cultural values that motivate dietary change to be effective. Yin et al. (2018) found that health care screenings motivated their participants to change their lifestyles, resulting in an improvement in the outcome measures. Seear et al.'s (2019) participants reported increased healthy lifestyle changes after attending a community-led diabetes prevention program. Weber et al. (2020) found that lifestyle interventions can be an effective tool to motivate the South Asian population to change their diet and physical activity behaviours. Brown et al. (2021) found that participants were motivated by a certificate of achievement at the end of a cultural diabetes education program to maintain their follow-up appointments and to evaluate their understanding of the program contents.

Healthcare providers need to conduct cultural intervention programs during diabetic health education to motivate people who take these programs. Dragomanovich and Shubrook (2021) and Valen et al. (2012) found that primary health care providers who used health beliefs during diabetes education classes provided a strong connection for the participants that motivated them to apply the program information to treatment decisions. Mohamed et al. (2013) mentioned that health educators counseled their participants in a culturally sensitive, structured education program about coping strategies, which offered the participants the motivation to control their diseases. Brown et al. (2021) found that their culturally tailored diabetes education program motivated Hispanic and Latino patients living with diabetes in group education about diet and lifestyle changes. These participants were motivated to explain their disease self-management and common barriers to treatment plans. Weber et al. (2020) and Nicolaou et al. (2014) found that family engagement in culturally tailored diabetes prevention programs can be a motivator for other family members to exercise and follow a healthy diet plan.

## Discussion

The purpose of this review was to find an approach to a culturally specific DMP that can be adopted and utilized in Qatar. Several components of culturally specific DMPs in PHCC facilities can fill the present gap among people who live with diabetes. According to this literature review, four important components should be involved in the culturally specific DMP in Qatar: information and understanding, cultural norms, cultural interventions, and personal motivation.

### Information and Understanding

Information and understanding were found in this review to be two of the most important components of culturally specific DMPs. It was found that participants in these programs need information and understanding about diabetes management because they are essential in the self-management of blood glucose levels. This finding is consistent with the findings of Pamungkas et al. (2020) who noted that information and understanding of diabetes management are linked with a better possibility of diabetes self-management practice and blood glucose monitoring. It was also found in this review that involving people who live with diabetes in the cultural diabetic educational program content is considered

## Cultural Norms

Cultural norms have been considered an important component of culturally specific diabetic management programs. Some cultural norms were noted in this review to present barriers to behavioural change and hinder the successful implementation of culturally specific DMPs. These barriers were hospitality and identity as well as gender roles. Hospitality was considered a challenge because high-calorie food with fat is expected to be a part of the identity of some people who live with diabetes. This is similar to the findings of Smith-Miller et al.'s (2017) study. Participants in their study reported that they faced pressure from family members and friends to eat or drink food with high calories during family and social events to maintain their identity. In addition, it was found in this literature review that traditional gender roles affected people who live with diabetes, especially after becoming parents. Mailey et al. (2014) also found that people who live with diabetes focused on their family needs and responsibilities more than their health needs when they had children. Many people connect to their culture through the food they eat. The cultural importance of food is passed from one generation to the next generation, connecting people to their families. Changing the way a person eats can be a challenge at first, especially if the person is diagnosed with diabetes.

## Cultural Interventions

Culturally specific DMPs were found in this review to be an important component in increasing the success level of the DMPs. The most important cultural interventions include using the native language of the person living with diabetes and providing family support for changing lifestyle and physical activity. It was found in this review that native language can be used in cultural diabetic educational programs to explain the program content. This finding is consistent with the findings of Balagopal et al. (2012) who found their participants preferred educational material in the Gujarati language to explain the advantages of dietary food because it increased their level of discussion and communication. In addition, it was found in this review that family support is another important facilitator because it can help people who live with diabetes to change their lifestyles. Similarly, Shepherd-Banigan et al. (2014) found that positive lifestyle changes occurred in people who live with diabetes when family support levels increased. It was also found in this review that health care providers can teach the family as a group to improve the health behaviours of people who live with diabetes by increasing family-based physical activity and social support. This finding is supported by Wheeler et al. (2012) who found that Hispanic people increased their amount of self-reported exercise after receiving support from their families.

## Personal Motivation

Personal motivation was found in this review to be needed while implementing culturally specific DMPs. This review highlighted different factors that motivate people who live with diabetes to avoid diabetic complications. It was found that increasing awareness about glucose levels and differences in blood test readings can motivate people who live with diabetes to change their dietary behaviours. This finding is consistent with the finding of Gopalan et al. (2015) who noted that their participants' awareness of pre-diabetes motivated them to change their dietary behaviours. It was also noted in this literature review that a feeling of respect for culture in nutritional counselling programs is considered important because it can motivate diabetic patients to continue lifestyle changes. Similarly, Ndjaboue et al. (2020) found that feeling one's culture was respected is an important motivator because it increases communication and understanding. In addition, family engagement was found in this review to motivate people who live with diabetes to control their diabetes and improve their health conditions. Rotberg et al. (2016) also found that patients who attended diabetic health educational meetings with their families were motivated to be engaged in social support, improve their quality of life, and increase diabetes control levels during follow-up diabetic clinic appointments. People who live with diabetes can be motivated in different ways by support from their families and friends, such as exercising with them, helping them to make healthy food choices, and encouraging them to take their medication and check their blood sugar regularly. This motivation was key in being able to communicate, share goals, and understand what it means to live with diabetes.

## Conclusion

Culturally specific DMPs have an important effect on diabetes care. This literature review aimed to assess the effectiveness of culturally specific DMPs employed in other countries within primary health care settings to determine an approach that can be used in Qatar. The most important components of culturally specific DMPs for people who live with diabetes are information and understanding, cultural norms, cultural interventions, and personal motivation. These components help to increase the amount of information provided to people who live with diabetes and their understanding of diabetes; clarify the cultural norms that affect them; provide cultural interventions to facilitate solving these barriers; and motivate these people to keep changing their lifestyles. Qatar is a country that has culturally diverse populations, thus tailoring diabetic management programs to the individual's culture is crucial. For DMPs to be successful, the PHCC needs to consider the significance of culturally specific DMPs in supporting people who live with diabetes.

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**Appendix A**
**Mixed Methods Appraisal Tool (MMAT), version 2018**

| Category of study designs | Methodological quality criteria | Responses | | | |
|---|---|---|---|---|---|
| | | Yes | No | Can't tell | Comments |
| Screening questions (for all types) | S1. Are there clear research questions? | | | | |
| | S2. Do the collected data allow to address the research questions? | | | | |
| | *Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.* | | | | |
| 1. Qualitative | 1.1. Is the qualitative approach appropriate to answer the research question? | | | | |
| | 1.2. Are the qualitative data collection methods adequate to address the research question? | | | | |
| | 1.3. Are the findings adequately derived from the data? | | | | |
| | 1.4. Is the interpretation of results sufficiently substantiated by data? | | | | |
| | 1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation? | | | | |
| 2. Quantitative randomized controlled trials | 2.1. Is randomization appropriately performed? | | | | |
| | 2.2. Are the groups comparable at baseline? | | | | |
| | 2.3. Are there complete outcome data? | | | | |
| | 2.4. Are outcome assessors blinded to the intervention provided? | | | | |
| | 2.5 Did the participants adhere to the assigned intervention? | | | | |
| 3. Quantitative non-randomized | 3.1. Are the participants representative of the target population? | | | | |
| | 3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)? | | | | |
| | 3.3. Are there complete outcome data? | | | | |
| | 3.4. Are the confounders accounted for in the design and analysis? | | | | |
| | 3.5. During the study period, is the intervention administered (or exposure occurred) as intended? | | | | |
| 4. Quantitative descriptive | 4.1. Is the sampling strategy relevant to address the research question? | | | | |
| | 4.2. Is the sample representative of the target population? | | | | |
| | 4.3. Are the measurements appropriate? | | | | |
| | 4.4. Is the risk of nonresponse bias low? | | | | |
| | 4.5. Is the statistical analysis appropriate to answer the research question? | | | | |
| 5. Mixed methods | 5.1. Is there an adequate rationale for using a mixed methods design to address the research question? | | | | |
| | 5.2. Are the different components of the study effectively integrated to answer the research question? | | | | |
| | 5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted? | | | | |
| | 5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed? | | | | |
| | 5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved? | | | | |

Note. From "Mixed Methods Appraisal Tool (MMAT) Version 2018: User Guide,"
by Q. N. Hong, P. Pluye, P., S. Fàbregues, G. Bartlett, F. Boardman, M. Cargo, P. Dagenais, M. P. Gagnon, F. Griffiths, B. Nicolau, A. O'cathain, M.C. Rousseau, & I. Vedel, 2018, (https://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/fetch/127916259/MMAT_2018_criteria-manual_2018-08-01_ENG.pdf)

# Appendix B

## Data Extraction Matrix for Articles

| Author, Date, Title & Country | Design, Sample & Data Collection | Purpose | Types of Cultural Interventions | Outcomes | Recommendations |
|---|---|---|---|---|---|
| **Author & Date**: Brown et al. (2021)<br>**Title:** A culturally tailored diabetes education program in an underserved community clinic<br>**Country:** USA | **Design:**<br>A quantitative non – randomized study, quasi-experimental design was used to compare pre/post data of a single group of participants.<br>**Sample:** $N = 16$ | To improve glycemic control in lower socioeconomic status Hispanic & Latino patients diagnosed with DM in a medically underserved community clinic using a culturally tailored DM education program. | Diabetes Empowerment Education Program (DEEP) was selected as the intervention for this project. | -Reduction in A1C levels<br>-Increased diabetes knowledge<br>-Improvement in diabetes Empowerment<br>-Reduction in weight | The patient centered principles of culturally competent care should guide both practitioners in caring for Hispanic patients with T2DM and those involved in program planning regarding diabetes in the Hispanic community. |
| **Author & Date:** Brunk et al. (2017)<br>**Title:** A culturally appropriate self-management program for Hispanic adults with type 2 diabetes and low health literacy skills.<br>**Country:** USA | **Design:** A descriptive qualitative study design and phenomenological analysis used.<br>**Sample:**<br>$N = 9$ from rural community health care centers<br>**Data collection** through focus group | To assess the feasibility of adapting a patient-centered educational intervention for T2DM self-management for a Hispanic population with low health literacy skills. | An educational program that instructed on low glycemic food choices, meaningful glucose self-monitoring, and physical activity to decrease blood glucose spikes. | Data supported the feasibility of adapting an established health-enhancing approach for promoting self-management of T2DM to a low health literacy Spanish-speaking population. | This report includes a recommendation that professional schools incorporate health literacy in the curricula to ensure that future practitioners can engage in effective information exchange with patients, their |

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| | sessions | | Participants' feedback was recorded during four weekly, 2 hour evening focus group sessions. | | family members, and other health care professionals. |
| **Author & Date:** Choi and Rush (2012)<br>**Title:** Effect of a short-duration, culturally tailored, community-based diabetes self-management intervention for Korean immigrants<br>**Country:** USA | **Design:** A quantitative descriptive study<br>**Sample:** ***N*** = 53 | To assess the effectiveness, feasibility, and acceptability of a short-duration, culturally tailored, community-based diabetes self-management program for Korean immigrants with T2DM delivered at a non-clinic-affiliated community center. | Short-duration, culturally tailored, community-based diabetes self-management program | -The community-based, culturally tailored education intervention was effective.<br>-Improved physiological outcomes and self-care behaviors. | Future studies with a larger sample size are needed to further examine changes in diabetes management behaviors across the intervention |
| **Author & Date:** Dragomanovich and Shubrook (2021)<br>**Title:** Improving cultural humility and competency in diabetes care for primary care providers<br>**Country:** USA | **Design:** Qualitative design/ case study<br>**Sample:** ***N*** = 1<br>**Data collection** through face to face interview | To highlight the health disparities that exist among patients with diabetes and to give the primary health care providers a framework to improve diabetes treatment through | Individualized treatment plan, helping the patient of this study to enroll in a diabetes education class with a Spanish-speaking diabetes educator. | This program allowed diabetic to<br>-continue eating the culturally important food while still making healthy alterations.<br>-Refer the patient to the diabetic educational classes to help achieving | Health care providers should face the challenges by keep training and confronting the uncomfortable reality of health disparities in the US. |

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| | | cultural competency and humility. | | glycemic control. | |
| **Author & Date:** Flood et al. (2017)<br>**Title:** A home-based type 2 diabetes self-management intervention in rural Guatemala<br>**Country:** Guatemala | **Design:**<br>Mixed methods: A prospective study of a diabetes self-management education intervention using a quasi-experimental, single-group pretest–posttest design.<br>**Sample:** ***N*** = 90<br>Descriptive statistics used to summarize data on participants' visits and demographic characteristics. | To evaluate a home-based diabetes self-management intervention in rural Guatemala. | This program consisted of 6 home visits (May 2014–July 2016) conducted by a diabetes educator using a curriculum culturally and linguistically tailored program to rural Mayan populations | -Participants' glycemic control and systolic level improved (but not diastolic) blood pressure at 12 months.<br>-Improved significantly during the intervention. | This study poir to the need for diabetes self-management education resea in resource-lim settings globall |
| **Author & Date:** Flores-Luevano et al. (2020)<br>**Title:** Impact of a culturally tailored diabetes education and empowerment program in a Mexican American population along the US/Mexico border: A pragmatic study<br>**Country:** USA | **Design:** A quantitative study, Quasi-experimental design. Non-randomized<br>**Sample:** ***N*** = 209<br>**Data collection** through group discussion sessions<br>Descriptive analysis was used | To deliver a diabetes education program under real world conditions and evaluate its effect on diabetes-related clinical, self-management and psychosocial outcomes among Mexican Americans residing along the | A bilingual culturally tailored diabetes education program incorporating hands-on participatory techniques was delivered in 4 - 8 weekly group sessions.<br>Clinical, self- | Improvements in clinical (glycaemia, cholesterol), self-management (glucose self-monitoring, exercise and diet), knowledge and psychosocial outcomes. | This article did have recommendatic |

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| | | US/Mexico border. | management and psychosocial outcomes were evaluated pre- and post-intervention with surveys and medical record review. | | |
| **Author & Date:** Goff et al. (2021)<br>**Title:** Healthy eating and active lifestyles for diabetes (HEAL-D), a culturally tailored self-management education and support program for type 2 diabetes in black-British adults: a randomized controlled feasibility trial.<br>**Country:** UK | **Design:** mixed-methods randomized controlled feasibility trial in black-British adults with T2DM.<br>**Sample:** ***N*** = 102 T2DM patients | To evaluate acceptability, fidelity and trial feasibility of the healthy eating and active lifestyles for diabetes ('HEAL-D') culturally tailored T2DM self-management education and support program. | Healthy eating and active lifestyles for diabetes | The intervention is highly acceptable for both patients and healthcare providers. | A future trial should assess clinical and cost-effectiveness of healthy eating and active lifestyles for diabetes. |
| **Author & Date:** Ho et al. (2021)<br>**Title:** Integrative nutritional counseling combining Chinese medicine and biomedicine for Chinese Americans with type 2 | **Design:** mixed methods<br>**Sample:** ***N*** = 15<br>**Data collection** through semi structured interview<br>Descriptive analysis was used | To describe the development and feasibility of integrative nutritional counseling (INC), CM) + a Chinese medicine | Integrative nutritional counseling program | -Improved attitudes and dietary habits aligning directly with INC,<br>-Improvement in biomedical valued measure so for | Future research should examine INC with a larger population and explore optimal delivery of INC |

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| diabetes: A mixed-methods feasibility study<br>**Country**: USA | | (biomedicine-based nutrition curriculum for Chinese Americans with T2DM. | | T2DM, such as weight loss, and CM-valued measures of digestion<br>-Elimination and hot/cold feeling.<br>Satisfaction with INC was high. | |
| **Author & Date:** Kohinor et al. (2011)<br>**Title:** Considerations affecting dietary behavior of immigrants with type 2 diabetes: a qualitative study among Surinamese in the Netherlands<br>**Country:** Netherlands/Holland | **Design:** qualitative study- grounded theory<br>**Sample:** *N* = 32<br>**Data collection** through in depth individual interviews | To explore the sociocultural factors affecting the dietary behavior of Hindustani and African Surinamese immigrants with T2DM living in the Netherlands. | Culturally sensitive diabetes education program | Highlights how the cultural values and customs influence the way in which immigrants with T2DM perceive and manage their diet. | Culturally appropriate approaches to education shou attentive to asp of culture that inhibit as well aspects that m enhance healt behavior. |
| **Author & Date:** Le et al. (2013)<br>**Title:** Characterization of factors affecting attainment of glycemic control in Asian Americans with diabetes in a culturally specific program.<br>**Country:** China | **Design:** Quantitative – cohort study<br>**Sample:** *N* = 327<br>**Data collection** through using retrospective study Analyzing data on electronic. | To compare glycemic control between Asian American (AA) and white patients (WA) and to characterize the factors associated with AA group reaching or not reaching glycemic target. | Analyzing data in electronic health medical records (EMR) | -Show the effectiveness of a culturally tailored diabetes program for AA group while raising concerns toward a trend of poorer glycemic control in certain AA subgroups.<br>-Help as a beginning step in | Future researc should study t various cultur factors related diabetes care i high-risk patie |

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| diabetes: A mixed-methods feasibility study<br>**Country**: USA | | (biomedicine-based nutrition curriculum for Chinese Americans with T2DM. | | T2DM, such as weight loss, and CM-valued measures of digestion<br>-Elimination and hot/cold feeling.<br>Satisfaction with INC was high. | |
| **Author & Date:** Kohinor et al. (2011)<br>**Title:** Considerations affecting dietary behavior of immigrants with type 2 diabetes: a qualitative study among Surinamese in the Netherlands<br>**Country:** Netherlands/Holland | **Design:** qualitative study- grounded theory<br>**Sample:** ***N*** = 32<br>**Data collection** through in depth individual interviews | To explore the sociocultural factors affecting the dietary behavior of Hindustani and African Surinamese immigrants with T2DM living in the Netherlands. | Culturally sensitive diabetes education program | Highlights how the cultural values and customs influence the way in which immigrants with T2DM perceive and manage their diet. | Culturally appropriate approaches to education should attentive to aspe of culture that m inhibit as well as aspects that may enhance healthy behavior. |
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| | | | | exploring the various factors that may contribute to the lack of success in reaching glycemic goal. | |
| **Author & Date:** Mohamed et al. (2013) **Title:** Culturally sensitive patient-centered educational program for self-management of type 2 diabetes: A randomized controlled trial **Country:** Qatar | **Design:** Quantitative-Randomized controlled trial **Sample:** *N* = 430 T2DM Arab countries patients **Data collection** through questionnaire, and focus groups/3 to 4 hours per session. 10 to 20 patients per session | To assess the effectiveness of a culturally sensitive, structure education program (CSSEP) on biomedical, knowledge, attitude and practice measures among Arabs with T2DM | The intervention was based on theory of empowerment, health belief models and was culturally sensitive in relation to language (Arabic), food habits and health beliefs. 4 sessions discussed diabetes pathophysiology and complications, healthy lifestyle, exercise benefits and goal setting, and enhancing attitude and practice using counselling techniques. | **Primary outcomes**: -reduction in HbA1C, lipid profile, albumin/creatinine ratio, BMI and blood pressure. **Secondary outcomes** Improvement in diabetes knowledge, attitude and practice. | The significant improvement in biomedical and psychosocial parameters prov a great opportun for the study to b replicated in the Arabian countrie |

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| **Author & Date:** Nicolaou et al. (2014) **Title:** Development of a diabetes prevention program for Surinamese South Asians in the Netherlands **Country:** Netherlands/Holland | **Design:** pilot study **Sample:** *N* = 35 **Data collection** through focus group discussions and in-depth interviews | To describe the development of the lifestyle intervention used in **DH! AAN**, a program that aimed to prevent diabetes in Surinamese adults of South Asian (SA) origin living in the Netherlands. | The intervention was based on personal lifestyle counseling with use of motivational interviewing in line with a successful diabetes prevention intervention that targeted the general ethnic Dutch population. | Provided valuable information about the place of food in the culture and the general values regarding physical activities that are relevant for the individual. | Motivation intervention should ensure that cultural components are employed according to the needs of each participant. |
| **Author & Date:** Ockene et al. (2012) **Title:** Outcomes of a Latino community-based intervention for the prevention of diabetes: the Lawrence Latino diabetes prevention project **Country:** USA | **Design:** Quantitative randomized controlled trial study **Sample:** *N* = 312 **Data collection** through focus group session | To test the effectiveness of a community-based, literacy sensitive, and culturally tailored lifestyle intervention on weight loss and diabetes risk reduction among low-income, Spanish-speaking Latinos at increased diabetes risk. | Cultural tailoring included dietary advice based on Latino foods, including the customization of Latino recipes; targeting cultural beliefs and attitudes toward diabetes prevention and delivery of the intervention in Spanish by | Developed an inexpensive, culturally sensitive diabetes prevention program that resulted in weight loss, improved HbA1c, and improved insulin resistance in a high-risk Latino population. | It will be important to explore possible genetic underpinnings for such population sensitivity |

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| | | | bicultural and bilingual. | | |
| **Author & Date:** Seear et al. (2019) **Title:** Piloting a culturally appropriate, localized diabetes prevention program for young aboriginal people in a remote town **Country:** Australia | **Design:** mixed methods study **Sample:** *N* = 10 **Data collection** through semi-structure interviews | In this study, a locally adapted community-led diabetes prevention program with local young Aboriginal facilitators was created and trialed through the Derby Aboriginal Health Service (DAHS). The aim of this study was to report the process of piloting this program and its acceptability and feasibility. | 8-weeks program highlighted causes and consequences of diabetes, incorporated physical activity and healthy eating topics with a focus on practical activities, and included stress management to support healthy lifestyles. | -Gained important new knowledge. -Made changes in behaviors including shopping choices, portioning and soft drink consumption. | Delivering this program multip times annually f several years is required to buil further commur support, normal participation, overcome sham embarrassment. |
| **Author & Date:** Valen et al. (2012) **Title:** An innovative approach to diabetes education for a Hispanic population utilizing community health workers **Country:** USA | **Design:** Mixed methods Quantitative descriptive/ survey based on data analyze them. Pretest and posttest. Descriptive analysis statistics used. **Data collection** through 2 questionnaires and | To deliver a culturally relevant diabetes education program to a Hispanic population at a migrant clinic | This educational program consisted of six, two-hour sessions delivered entirely in Spanish by Hispanic CHWs. | -Improvement in community health workers diabetes-related knowledge. | Future program should focus on community heal workers outcom including impro confidence, leadership skills and satisfaction addition to diab related knowled |

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| | contained three open-ended questions regarding diabetes management strategies learned and 17 Likert scale items | | | | |
| **Author & Date:** Weber et al. (2020)<br>**Title:** Tailoring lifestyle programs for diabetes prevention for US South Asians<br>**Country:** USA | **Design:** mixed methods (pilot, pre-post study to test the feasibility and impact of delivering the culturally tailored program.<br>**Sample:** *N* = 109<br>**Data collection** through Focus group discussions<br>Descriptive analysis used | To develop and test the feasibility of a culturally tailored diabetes prevention program (DPP) for US South, a large population with high diabetes risk. | South Asian Health and Prevention Education (SHAPE) program included: (1) focus group discussions with South Asian adults to understand views of lifestyle behaviors and diabetes prevention; (2) modification of the US DPP for South Asians and (3) a pilot, pre–post study to test the feasibility and impact of | -Provide important information on the barriers faced by US South Asians in participating in 'standard' lifestyle change programs.<br>-Show positive impact of a culturally tailored program for diabetes prevention in South Asian population. | Future work sho focus on testing SHAPE intervention in a larger trial, collecting more formalized feedl on program acceptability an considering additional intervention mo a family-based program, for instance, to addr the high risk of diabetes in this community. |

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| | | | delivering the culturally tailored program. | | |
| **Author & Date:** Yin et al. (2018)<br>**Title:** Cultural adaptation of an evidence-based lifestyle intervention for diabetes prevention in Chinese women at risk for diabetes: results of a randomized trial<br>**Country:** China | **Design:** Quantitative-randomized controlled trials<br>**Sample:** *N* = 75 | To test the feasibility and effectiveness of an evidence-based diabetes prevention program in Yuci, Shanxi Province, China from 2012 to 2014. | Diabetes prevention program (DPP) | Prevent diabetes in at-risk women in community health centers in China is feasible and acceptable. | Future implementation studies are needed to test PATH effectiveness in a large RCT with refinement of the intervention based on feedback from this study. |