February 2016

Health Coaching in Faith-Based Community Diabetes Education

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According to the World Health Organization (WHO), 347 million people worldwide have diabetes and among these, 29.1 million are Americans (World Health Organization [WHO], 2013). This equates to 9.3% of the United States (U.S.) population (Centers for Disease Control and Prevention [CDC], 2014). Of those with diabetes, an estimated 8.1 million people are undiagnosed. The majority of those with diabetes are between the ages of 20 and 65 (CDC, 2014).

With an annual cost of $322 billion for diabetes in both direct and indirect costs in the U.S., the medical expenses for those with diabetes are over twice as high as those without diabetes (Dall et al., 2014). Limitations on the financial resources available create an issue with supply and demand related to treatment of diabetes. As little as 4% of those who are uninsured or have Medicaid health plans received the recommended standards of education related to diabetes or diabetes prevention (Shaw, Killeen, Sullivan, & Bowman, 2011). Those with high deductibles or without insurance are less likely to seek preventive healthcare which may lead to serious health issues requiring emergency care (Davis, Pope, Mason, Magwood, & Jenkins, 2011).

The benefits of diabetes education include improved glycemic control and reduction in overall healthcare costs (Mickelethwaite, Brownson, O'Toole, & Kilpatrick, 2012). Community-based diabetes education programs are viable solutions in reducing disparities by meeting the needs of the ever increasing population with diabetes (Mickelethwaite et al., 2012). Diabetes education programs held in collaboration with faith community nurses (FCNs) are effective in health promotion and meeting the needs of people with type 2 diabetes (Dyess & Chase, 2010).

As part of type 2 diabetes management, lifestyle changes are necessary, but many individuals lack the ability to achieve the necessary behavior changes (Chlebowy et al., 2014). An individual's ability to perform self-care comes from both knowledge and motivation (Minet, Lonig, Henriksen, & Wagner, 2011). Demands from family, work, and social networks influence the individual's ability to perform self-care (Minet et al., 2011). If self-management recommendations are not followed, the risk for complications increases (Wolever et al., 2010).

A health coaching intervention of motivational interviewing can be used to improve chronic disease management through achievement of health promotion goals (Melko, Terry, Camp, Xi, & Healeu, 2009). Health coaching has been used in people with type 2 diabetes to improve medication adherence, diet, and

exercise. Through coaching, increased confidence toward goal achievement related to self-care skills can be realized (Melko et al., 2009).

Type 2 diabetes poses a significant health burden in the U.S. due to complications resulting from uncontrolled blood glucose levels and more evidence-based solutions through research are needed to improve diabetes outcomes. Community diabetes education can be utilized as a means to provide the needed knowledge for individuals to manage the disease. A faith community diabetes education program was conducted along with health coaching in order to determine if health coaching could increase self-efficacy in people with type 2 diabetes in comparison to no additional intervention.

Theoretical Framework

Self-efficacy is related to the confidence to perform self-care skills (Resnick, 2014). Among individuals with type 2 diabetes, an increased level of self-efficacy has been associated with self-management behaviors (Sarkar, Fisher, & Shillinger, 2006). Bandura's Theory of Self-Efficacy is a social cognitive theory often been used by nurse researchers in studying client outcomes, patient education, and nursing competency (Resnick, 2014). Resnick adapted Bandura's theory for use in research with the Middle Range Nursing Theory of Self-Efficacy (Resnick, 2014).

Cognitive behavior is based on outcome expectations and self-efficacy expectations (Resnick, Wehren, & Orwig, 2003). Outcome expectations involve the belief that certain results will be produced by specific actions, whereas self-efficacy expectations are the belief in one's ability to perform the actions. Self-efficacy is the confidence to perform certain tasks and is influenced by successful past performance, encouragement, modeling, and by reinforcement (Resnick et al., 2003). In relation to diabetes, individuals need confidence to perform self-care behaviors to manage the disease. According to Resnick, people who believe they can follow an exercise plan will more likely perform exercise behaviors. The level of self-efficacy can be influenced through interventions of encouragement, education, and support (Resnick, 2002). Identification of goals and positive reinforcement through health coaching can motivate people with type 2 diabetes to improve self-care.

Problem Statement

According to research data, about half of those with diabetes receive the necessary education to self-manage the disease (Chen, Cheadle, Johnson, &

Duran, 2014). In rural areas as compared to urban areas, less than half the residents received the needed diabetes education (Hale, Bennett, & Probst, 2010). Contributing to the higher rate of diabetes in rural areas are lower education levels, less available health care facilities, and limited income levels (Hale et al., 2010).

Poorly controlled diabetes leads to an increased risk for complications (Wolever et al., 2010). In a study by Balamurugan, Rivera, Jack, Allen, & Morris (2006), benefits of diabetes education included improved glycosylated hemoglobin (HbA1c) resulting in fewer hospital admissions thus allowing cost savings. Seto, Turner, & Champagne (2012) found that for every $1 spent in early treatment of diabetes, including education; nearly $9 is saved by reducing complications. American Diabetes Association (ADA) clinical practice guidelines recommend diabetes self-management education at diagnosis to lower HbA1c and prevent complications (ADA, 2015). Despite evidence to support the need for diabetes education, high risk populations are the least likely to receive services (Chen et al., 2014). Only 5% of Medicare beneficiaries received diabetes education services covered under Medicare due to limited availability of services and physician unawareness of coverage benefits (Strawbridge, Lloyd, Meadow, Riley, & Howell, 2015). Without intervention, the societal burden of diabetes will continue to grow related to health care expenses, lost productivity, and the drain of resources (ADA, 2013).

Purpose

Because of the prevailing disparities, community-based diabetes programs are necessary to fill the gaps that exist. Diabetes education focusing on behavior modification is needed in order for individuals to make lifestyle changes related to diet and exercise (Wu et al., 2007). Research has shown the benefits of diabetes education, but persons with diabetes may still lack confidence in performing self-care. With improved self-efficacy, individuals may better manage their disease (Wu et al., 2007). The purpose of this study was to determine if an intervention of diabetes education with health coaching would increase self-efficacy related to diet, exercise, and decision making skills with diabetes management. The study attempted to answer a clinical question: Following a faith-based community diabetes education program, does health coaching increase self-efficacy in people with type 2 diabetes in comparison to no additional intervention?

Methods

A pilot study was conducted utilizing an experimental pre-test/post-test format for data collection. Flyers explaining the program were distributed to area churches through FCNs, email, and direct mail. The flyers were also placed in church newsletters, posted on bulletin boards, social media, or promoted through health ministry initiatives at the churches. There was no charge for participants to attend the program, which was held at a church parish center located in a Midwest community. As part of the program, the primary investigator who is a Certified Diabetes Educator and Certified Health Coach collaborated with FCNs to provide diabetes education.

Participants

Participants were referred to the program through FCN programs and through community churches. Participants were directed to call the primary investigator in order to register. The participants were not limited by denomination or church affiliation.

Inclusion criteria for participants were comprised of people with type 2 diabetes between the ages of 18 and 85. The participants must have been able to perform self-care tasks related to diabetes and be able to speak English. Exclusion criteria included individuals out of the age range, individuals with type 1 diabetes, inability to perform self-care and those unable to understand English. Cognitive impairment was another criterion for exclusion, as those individuals may have had memory issues or inability to understand the information presented. While registering participants, basic screening questions were asked by the primary investigator regarding age, ability to speak English, ability to perform self-care, type of diabetes, and ability to understand instruction in order to ensure participants met inclusion criteria. Of the 23 people who registered, 16 participated and completed the program. None of the 16 participants were lost to attrition. Institutional review board (IRB) approval was obtained prior to beginning the pilot study.

Confidentiality and Consent

Written informed consent was obtained from each participant at the first session. The consent explained potential risks and benefits as well as participant rights. Participants were given an option to decline participation at any time during the project without penalty or loss of incentives. Confidentiality was maintained with

the pre-test/post-test by the participants creating unique code numbers. The completed surveys were kept confidential and securely stored in a locked cabinet.

Survey Tools

Two evidence-based valid and reliable instruments were utilized along with demographic questions in the research survey. The Short Diabetes Knowledge Instrument (SDKI) was a 13 item multiple choice instrument with a maximum possible score of 13 (Quandt et al., 2014). Participants were instructed to select the best answer for each item. The instrument measured general knowledge of diabetes including questions regarding blood glucose levels, exercise, nutrition, and complications. A choice of "*I don't know*" was included to reduce the chances of participants randomly guessing correct answers (Stanford University, 2009).

The Diabetes Self Efficacy Scale (DSES) was an eight item Likert scale used to measure self-efficacy (Lorig, Ritter, Villa, & Armas, 2009). This instrument measured confidence in performing self-care activities related to diabetes, such as managing diet, exercise, and blood glucose levels. A Likert rating from 1 = *not confident at all* through 10 = *totally confident* was used and a total maximum score was 80 (Lorig, et al., 2009).

In addition to the two evidenced-based tools, the pretest also included demographic questions. Items related to age, gender, ethnicity, number of years with diabetes, highest level of education, and past diabetes education were included. Self-reported HbA1c levels and treatment regimens including diet, exercise, and medication were also included in the questions.

At the initial session, an informed consent was obtained. The participants were asked to use an individual identification code for confidentiality. The 16 participants drew color coded cards from a nontransparent bag. The cards were used to randomly assign each participant into one of
two groups. There were eight participants in group A and eight in group B.

The pre-test survey consisting of the SDKI, DSES, and demographic questions were administered to all participants. Following the pre-test, all participants attended a diabetes education program based on the American Association of Diabetes Educators (AADE) national standards (Haas et al., 2012). Participants were provided a packet of education materials that included a copy of the PowerPoint presentation handout and diabetes care information. The program lasted approximately 90 minutes and was administered by the primary

investigator. Content included discussion of the disease process of diabetes, nutritional management, physical activity, medications, monitoring blood glucose, preventing and detecting acute and chronic complications, management strategies, and health promotion (Haas et al., 2012). The participants were all given reminder cards of when to return. Group A participants were assigned to the intervention group and were instructed to return the second week for a face-to-face health coaching session where individual goals for health improvement were set by the participants. Participants in this group also received follow-up health coaching by telephone on the third week of the program. The primary investigator facilitated the health coaching both in person and by phone. During these sessions, the focus was on personal goal achievement and health behavior changes related to diabetes management. Those assigned to group B had no further intervention and returned for the final session along with group A on week five. Reminder calls were placed to all participants prior to the final session to reduce the risk for attrition.

A post-test survey was administered to all participants at the final session in week five. The post-test survey utilized the SDKI and DSES instruments but excluded demographic information. A celebration of completion was included and carbohydrate controlled healthy snacks were provided. A prize drawing for incentive gifts was held for an activity tracking band, Subway gift cards, and diabetic cookbooks. Blood glucose meters were provided for those who did not have these supplies.

Statistical Analysis

Statistical Analysis Software (SAS) software version 9.3 was used for data analysis. An alpha of 0.05 was used for all analyses. In the larger study to be conducted at a later date, a power analysis will be performed to determine the appropriate sample size. An independent *t*-test analysis was used to measure the differences between the intervention and control groups on four measures (pre and post SDKI and pre and post DSES).

Although the purpose of the study was to measure the effects of health coaching on self-efficacy, ancillary analyses were also used including paired *t*-tests to determine differences in pre and post-test scores when combining both groups. Paired *t*-tests were also used to determine differences in pre and post-test scores for the two groups separately. In addition to *t*-tests, a Pearson correlation coefficient was utilized as an ancillary analysis to measure the relationship between the variables of pre and post-test SDKI and pre and post-test DSES.

Results

In analyzing the demographic data, the participants were 75% female, with a mean age of 68 years and all were Caucasian. With an average length time of 10 years of living with diabetes, the majority had been educated on diabetes in the past. In regard to education level, over half had at least some college education and of the remainder of the participants, three were high school graduates, one had a graduate equivalency degree (GED), and one did not provide a response to the education question. In answer to the question regarding their treatment for type 2 diabetes, 75% controlled diabetes by diet, 56% indicated exercise as a treatment, 63% were on oral medication, and 31% were taking insulin.

The results indicate the intervention of health coaching did not have a significant effect on self-efficacy. An independent *t*-test showed no significant difference in DSES scores from pre-test to post-test between groups. Results are displayed in Table 1 below.

Table 1

Difference Pre/Post Test SDKI Between Groups, Independent t-Test Results (N16)

	N	Mean/SD	*T*	DF	*p*	F	CI
Pre-test SDKI							
Control	8	10.25/2.12					
Intervention	8	9.38/2.45					
			0.76	14	0.4573	0.717	0.95
Post-test SDKI							
Control	8	11.38/1.30					
Intervention	8	10.63/1.51					
			1.07	14	0.3	0.711	0.95
Pre-test DSES							
Control	8	54.75/13.73					
Intervention	8	56.38/12.69					
			-0.25	14	0.81	0.84	0.95
Post-test DSES							
Control	8	61.5/10.27					
Intervention	8	61.38/9.44					
			0.03	14	0.98	0.83	0.95

In addition to the independent *t*-test between groups, ancillary analyses were conducted. Paired t-tests results showed the individual DSES scores among all participants were significantly improved from pre-test to post-test irrespective of groups (n 16, *t* -2.44, *p* 0.028, CI 0.95). In addition, there was statistically significant improvement with the SDKI for individual scores pre-test to post-test among all participants (n 16, *t* -2.45, *p* 0.027, CI 0.95).

Table 2

Difference Pre/Post Test Among All Participants, Paired t-Test Results (N16)

	N	Mean/SD	T	P	CI
Pre SDKI-Post SDKI	16	-1.19/1.94	-2.45	0.027*	0.95
Pre DSES-Post DSES	16	-5.88/9.64	-2.44	0.028*	0.95

Within the treatment group, significantly improved SDKI scores were seen from pre to post-test (n 8, *t* -2.38, *p* 0.05, 0.95) through further *t*-test analysis. No other significant results were found within groups through this ancillary analysis. Results from *t*-test analysis of pre-test/post-test results within groups are displayed in Table 3 below.

Table 3

Difference Pre/Post Test Within Groups, t-Test Results (N 16)

	N	Mean/SD	T	P	CI
Control Pre-Post SDKI	8	-1.13/2.42	-1.32	0.23	0.95
Control Pre-Post DSES	8	-6.75/9.45	-2.02	0.08	0.95
Intervention Pre-Post SDKI	8	-1.25/1.48	-2.38	0.05*	0.95
Intervention Pre-Post DSES	8	-5/10.39	-1.36	0.22	0.95

Utilizing a Pearson correlation, a statistically significant correlation

between SDKI pre-test and the DSES post-test was revealed. No other significant results were found. The correlation results are displayed in Table Four below.

Table Four

Pearson Correlation (N16)

	Pre SDKI (*r/p*)	Post SDKI (*r/p*)	Pre DSES (*r/p*)	Post DSES (*r/p*)
Pre SDKI	1	0.52/0.038	0.32/0.227	0.67/0.004*
Post SDKI	0.52/0.038	1	0.10/0.693	0.8/0.145
Pre DSES	0.319/0.227	0.107/0.69	1	0.66/0.005
Post DSES	0.674/0.004*	0.381/0.145	0.66/0.005	1

Limitations

This study has several limitations including a small sample size. The limited racial and gender diversity among the participants restricts the ability to generalize the results to the population. With participants being recruited from faith communities, those individuals who did not belong to a faith community may have been overlooked. Participants who volunteered may be inherently different from that of the general population, thus limiting the generalizability of results. The majority of the participants also had past diabetes education, which may account for the improved diabetes knowledge level due to repetition of information.

Discussion

Although the intervention of health coaching did not lead to significant increases in self-efficacy, the ancillary analyses results show other positive benefits to the diabetes program. The individual knowledge and self-efficacy scores improved which may lead to better diabetes self-management for the participants. A positive correlation between diabetes knowledge and improved self-efficacy may suggest improving diabetes knowledge through education is beneficial toward improved self-efficacy.

Due to the limited resources in rural areas, community health needs may be met through faith-community solutions related to education and health coaching. In this pilot study, diabetes education was provided along with an additional intervention of health coaching in an attempt to determine if the coaching intervention could improve self-efficacy. Even though there was no significant improvement in self-efficacy between groups, individual self-efficacy and knowledge level scores were improved.

The increased self-efficacy can be translated to improved confidence in diabetes self-management behaviors. Although it was impossible to determine the long-term health benefits of the study, the improvements pre to post-test were positive. Because many barriers exist for people with diabetes, exploring community health options can provide a means to reduce the risk of complications of diabetes by improved management strategies and behavior changes.

Conclusion

Providing diabetes education and health coaching in faith community settings not only provides a means for parishioners to learn more about the disease, but also can help improve self-efficacy related to self-management. Although this study found no significant effect from health coaching interventions on self-efficacy, all individuals did gain improved self-efficacy and knowledge of diabetes. A future study with a larger sample size should be conducted to reduce limitations and improve generalizability. Diabetes education and health coaching through faith communities is a viable solution to the gaps in community health needs.

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