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**A Nurse-Practitioner-Led Collaborative Care Model of
Shared Medical Visits for Adult Patients with Diabetes Using
the Centering[®] Group Healthcare Model**

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Purpose

The purpose of this paper is to describe a novel Shared Medical Visit (SMV) intervention to address the health needs and challenges of an adult population with type-2 diabetes (T2D) in a Federally Qualified Health Center (FQHC) setting, the fidelity to the intervention, as well as to determine the feasibility and acceptability of this intervention.

Methods

The study method was a quasi-experimental post-test design and the intervention consisted of eight monthly two-hour shared medical visits (defined as inter-professional medical visits), which used the American Association of Diabetic Educators AADE7 diabetes education topics for content and the Centering® Healthcare Model of group visits for structure and process. There were also 19 weekly 60-minute Self-Management Support (SMS) visits to help with goal setting, coping, and problem solving. Feasibility and acceptability were evaluated by measuring attendance, model fidelity, participant satisfaction, and staff satisfaction.

Results

The SMVs and SMS visits were completed as planned and fidelity was maintained. Attendance was low for both intervention components, but participants and staff reported positive experiences and interest in continuing with this format.

Conclusions

Attendance was a major challenge for participants. The pilot program showed that this format can benefit from a shorter overall duration, which may require alternative self-management support interventions, such as text messaging.

Introduction

Type 2 diabetes (T2D) is a major health problem in the United States that is becoming more prevalent. The number of people affected by diabetes is expected to triple in one generation. The Centers for Disease Control (CDC) estimates that one in three people with diabetes are not diagnosed or treated for the condition. T2D, and associated co-morbidities, present a large human and economic cost (Centers for Disease Control and Prevention, 2014). The American Diabetes Association reported that one in five health care dollars are spent on the care for patients with diabetes (American Diabetes Association, 2013).

Underserved populations (e.g., minority racial/ethnic background, low socio-economic status, under or un-insured, English as second language, or undocumented status) suffer a greater burden of diabetes, with higher prevalence rates of T2D, as well as a higher prevalence of diabetes-related morbidity and mortality (Lanting, Joung, Mackenbach, Lamberts, & Bootsma, 2005). Underserved populations struggle more to cope with adversity, to manage multiple tasks, to set realistic goals, and to overcome major life transitions, such as the end of a close relationship, loss of a job or home, or a new medical diagnosis. These psychosocial stressors create mental and physical barriers that keep people from adopting healthy behaviors, and actually increase health risk behaviors such as smoking, alcohol and illicit drug use, and having a sedentary lifestyle, as a means of coping. This cascade of factors, coupled with low health literacy and education attainment, may contribute to the poorer health outcomes in socioeconomically disadvantaged populations (Lantz et al., 1998; Mehta, House, & Elliott, 2015; Shi & Stevens, 2010).

Understanding the individual, social, and contextual factors that may influence self-management is critically important in caring for the underserved with a chronic illness. Self-

management of T2D requires significant behavioral changes, which contribute to positive health outcomes. Behavioral change is difficult; however, group self-management education programs have been shown to improve clinical, lifestyle, and psychosocial outcomes (Kaltman et al., 2016).

A group medical visit represents a model of care that has gained in popularity in the past 20 years and has been shown to be an acceptable option of regular primary care for a medically underserved population (Clancy, Yeager, Huang, & Magruder, 2007). Group medical visits also can provide education and self-management coaching. Utilizing group medical visits in order to support self-management in adults with diabetes has improved glycemic control and medication adherence (Deakin, McShane, Cade, & Williams, 2005; Edelman et al., 2012; Sanchez, 2011; Simmons & Kapustin, 2011; Trento et al., 2010). Group medical visits also improve access to medical services, provide better monitoring of chronic illness in high-risk populations, increase satisfaction with care, self-efficacy and self-reported quality of life, and decrease utilization of emergency or outpatient services (Eisenstat, Ulman, Siegel, & Carlson, 2013; Jaber, Braksmajer, & Trilling, 2006; Noffsinger & Scott, 2000). Clinical staff benefits also include inter-professional education opportunities (Kirsh, Schaub, & Aron, 2009), peer support, variation to their practice setting, and more time with patients to provide education (Gutierrez, Gimpel, Dallo, Foster, & Ohagi, 2011).

There are a variety of approaches to implementing group visits in the primary care setting. The shared medical visit (SMV) is a type of group visit that involves a primary care provider (physician, physician assistant, or nurse practitioner) and professionals from different clinical specialties, such as nursing, nutrition, behavioral health, or pharmacology. SMVs focus less on hierarchy and more on collaboration between different health care professionals. This

approach allows the medical team to better appreciate the complexity of caring for patients with a chronic illness from the patient's perspective, and also demonstrates the value of teamwork (Kirsh et al., 2009). The common elements for a successful SMV are listed in Table 1.

A group model of care, aligned with the SMV, also exists for expecting mothers and new parents. The group prenatal model of care was developed by the Centering[®] Healthcare Institute (CHI) as an alternative to traditional prenatal care (Rising, Kennedy, & Klima, 2004). In several studies, interventions based on this model have improved regular attendance at prenatal visits, contributed to appropriate weight gain during pregnancy, and increased breast feeding rates and overall participant satisfaction in busy public health clinics with predominantly low-income women (Bloomfield & Rising, 2013; Ickovics et al., 2003; Klima, Norr, Vonderheid, & Handler, 2009). Improvement in depressive symptoms, stress, and anxiety in a, psychosocially, more vulnerable population have also been reported (Benediktsson et al., 2013). The Centering[®] model has been modified successfully for breast cancer survivors (Trotter, 2013) and may be beneficial for adults with T2D who have limited resources and high psychosocial comorbidity.

The purpose of this paper is to describe a novel SMV intervention that addresses the health needs and challenges of an adult population with T2D in the Federally Qualified Health Center (FQHC) setting. We will also describe the fidelity to the intervention, as well as feasibility and acceptability of the intervention, by evaluating attendance, participant satisfaction, and staff satisfaction.

Study Design and Methods

The study was designed as a quasi-experimental post-test study with data collected at the end of the program. The intervention consisted of monthly SMVs and weekly self-management Support (SMS) visits to specifically address the needs of a medically underserved population.

These two intervention components were intended to build on the known benefits of group interaction, foster a shared sense of purpose and accomplishment, help participants build on successes, and provide weekly support in terms of goal setting and facing psychosocial challenges that interfere with positive health behaviors and goals.

Study Population

The setting was an urban FQHC that provides primary medical, behavioral health and dental care to a medically underserved population, and is one of 13 primary care hubs in Connecticut managed by the Community Health Center, Inc. (CHCI), headquartered in Middletown, CT. The CHC of Danbury, where this intervention was implemented, serves 5035 active patients, with 27440 visits in the past 18 months, at an average of 3.5 visits per year per patient. Of these patients, 8.8% are identified as adults with diabetes. They make up approximately 2400 visits to the CHC total in the past 12 months, averaging 5 visits per patient per year. (CHCI data as of 1/2/2016).

Participants with a diabetes diagnosis by ICD code and an office visit in the past 12 months from one primary care provider's (PCP) panel of adults were invited to participate in this feasibility study. The provider's nurse contacted each potential participant from the panel by phone or in person and invited him or her to participate in the intervention. Approximately 60 patients met the above criteria and were contacted. Of those, 12 adults with T2D agreed to participate in the study. Common reasons for not participating included satisfaction with current care, inability to make planned group visit days/times, and lack of interest in a group visit.

SMV Implementation

The SMVs followed an eight-visit curriculum over approximately seven months and were based on the Centering[®] Healthcare model and AADE7 framework for diabetes education.

The Centering® Healthcare model provided the guidelines for the group process (Table 2). The AADE7 Self-Care Behavior topics provided an evidence-based and systematic content focus of the visits as outlined in the National Standards for Diabetes Self-Management Education and Support (Haas et al., 2014) (Table 3 and 4). The SMV's were 120 minutes long and scheduled to take place once every four weeks. A participant workbook was provided at the first visit, with details on the topics covered at each visit, worksheets for self-assessment, tables to record physiological measures, and a section for personal notes. The reading level of this material was designed to meet a fourth-grade reading level.

A typical SMV visit was led by two co-facilitators, usually the participant's PCP and either a nurse, nutritionist, clinical diabetic educator, or social worker. The room was set up with chairs arranged in a circle, an appropriate light meal was provided on a side table (usually breakfast), and relaxing music was playing in the background. After all participants arrived (punctuality was encouraged), the visit started with an opening exercise (centering activity) that focused their attention on the present moment and the other participants. These activities involved an affirmation of today's intention or an icebreaker, such as a ball-tossing game, in which participants call out other participants' names and throw a small beanbag or ball to them.

This was followed by a self-assessment activity, which adhered to the AADE7 Self-Care Behavior topics. Discussion of the self-assessment was designed to maximize participation by using a variety of activities. For example, participants could write their answer to a personally sensitive question on a piece of paper (i.e., taking medication), crumple it up and toss it in pile at the middle of the circle. Another participant then picks it up and reads it. The group was then asked to give encouraging advice or comments. Participants also took their own blood pressure and heart rate, weighed themselves, and recorded their blood glucose in their workbooks. This

information was transcribed into the electronic medical record by the nurse or the medical provider.

While the emphasis was on content, close attention was placed on the process of how the participants, and the group as a whole, engaged with the content and how this could lead to changes in self-care behavior, such as eating healthy or exercising regularly. The centering activity and the self-assessments are integral parts of the Centering® model, as they encourage participants to mindfully focus on the present and engage in important aspects of their self-care. The circular arrangement of chairs also supports group interaction and a sense of equality.

After the self-assessment activity, each participant met individually with the medical provider, off to the side, but in the same space, to address any individual needs, such as medication refills, abnormal test results, or other concerns not shared in the group. Some visits included a cooking or food demonstration, physical exercise, or guided discussion by the nutritionist or behavioral health clinician. Each visit ended with a closing activity that aimed to refocus participants (i.e., stating a new goal or something new learned that day, meditation or relaxation exercise). The next visit date and topic were provided.

SMS Implementation

The weekly SMS visits with one of the SMV co-facilitators lasted about 60 minutes. The facilitators helped participants set initial goals at the first SMS visit and discussed successes and barriers in subsequent visits. Coping and problem solving skills were also reviewed. The process of achieving behavioral change was emphasized by exploring the individual steps of the SMART goal format, which breaks a goal into five smaller steps: *S*pecific, *M*easurable, *A*chievable, *R*elevant, and *T*imely. This format has shown to be effective within various settings, ranging from clinical psychology to industrial manufacturing, as it helps to define, in detail, what criteria

has to be met in order for a goal to be truly achieved (Doran, 1981; Locke & Latham, 2013; Locke, Latham, Smith, & Wood, 1990). Goals were recorded in the participant workbook and electronic medical record by the nurse using established electronic medical record data fields for self-management.

Visit Logistics

Institutional Review Board approval was obtained from the clinical agency for this study. The clinical team consisted of the PCP, a nurse practitioner, a registered dietitian, a licensed clinical social worker, a registered nurse, and a medical assistant (who facilitated scheduling and coordination of the visits). The research team included two research assistants who were involved in the IRB consent process and post-test evaluations.

It was critical to obtain support from the administrative leadership in order to manage scheduling (to secure consistent time blocks in the schedule, schedule patients, and complete reminder calls) and reserve space that was both large enough and provided uninterrupted group time. A grant was obtained from the regional United Way chapter to provide funding for incidental expenses, including educational materials, copying services, and food utensils/items used for the cooking demonstration and weekly breakfast.

The visits were scheduled using an electronic scheduling system, which also created automated reminder calls on the day before the visit. In addition, a receptionist called participants on the morning of the visit to confirm their attendance, as attendance rates in this population traditionally range from 50-70% (from internal CHCI no-show data). If a participant did not attend a scheduled appointment, an alert was placed in the system that triggered a follow-up call and alerted any receptionist of the no-show when the participant called again. This is standard procedure for all patients at this agency.

All visits were billed as individual visits, as they contained individual components, including individual health assessment (vital signs, self-assessment) and individual time with the PCP or nurse to review individual health issues such as medication management, screenings and vaccines (Centers for Medicaid and Medicare Services, 42 CFR Part 405 Subpart X).

Evaluation Methods

Participant demographics were collected from the electronic medical record. A log with attendance was kept and reason for absence, such as illness, transportation problems, and scheduling conflicts, was noted.

Fidelity to facilitator and group activities during the SMV were assessed using the Centering[®] Healthcare Model's Facilitator's Process Evaluation (unpublished), which is completed by both facilitators at the end of each SMV. Items include attendance, participant self-assessment, physical assessment by the medical provider, group dynamics, group discussion, and content. Cumulatively, these evaluations serve as benchmarks for assessing progress in the curriculum.

Participant satisfaction was evaluated at the end of the program and scored using a 16-item survey on a 5-point Likert scale ranging from Strongly Agree to Strongly Disagree (see Table 6 for questions). This survey was collected in a phone interview conducted by a separate member of the research team following the last group visit.

The staff satisfaction survey was completed by all clinical staff involved in the SMV and SMS visits at the end of the project using an anonymous on-line questionnaire. The survey consisted of nine questions regarding the value of the SMV format in helping staff manage clinical care, as well as the value it added to their professional activities, and was scored on a 5-point Likert scale ranging from Strongly Agree to Strongly Disagree.

Results

This project started in the fall of 2015 with 12 participants. The 8 monthly SMVs and 19 weekly SMS visits (excluding the week of the SMV) were to take place over a seven-month time period ending in March 2016. Participants' demographics, insurance, and baseline physiological data were consistent with the general clinic population. The average age of participants was 52.5 years. 67% of participants were male. 42% of participants were white, 25% were black, and 33% were Hispanic (Table 5). All participants were insured, with most on state Medicaid or Medicare.

Attendance averaged 30% across all scheduled visits (39% for SMVs, 26% for SMS), which was below agency-wide no-show rates for individual medical and group medical visits of 30-50%, but comparable to behavioral health group attendance at CHCI (internal no-show data, CHCI, 2016). All participants attended the first two visits. Visit three was scheduled for right after Thanksgiving and visit four took place between Christmas and New Year's Day. These two visits were not well attended, with about 4 patients attending each visit. Attendance did not improve after that and the same 3-4 individuals eventually attended the remaining SMVs and SMS visits. Participants reported a variety of reasons for not making it to the group visits, including acute illness or injury, caring for an elderly parent or ailing sibling, child care conflicts, transportation problems, and picking up short-notice work.

Overall, the program was implemented as planned and Centering® Health Care facilitator process evaluations were completed after each SMV. Participants completed self-care activities (recording of weight, blood pressure, and glucose measurements) and eventually did not need prompting to do so at the end of the program, although they did not bring their workbooks consistently. Only one participant brought a support person for one visit. Group dynamics were positive, with participants voluntarily sharing information and being attentive and respectful of

each other. Group discussion was reported to be more like a peer group discussion than a lecture, with members appearing to connect both with each other and the facilitators. The planned content was addressed with a variable level of depth, depending on how much time was needed for individual components.

Satisfaction with the program from participants was generally positive. Nine of the 12 (75%) who initially signed up for the visits completed the survey, which was by phone by a research team member. Scores on the survey ranged from 4.22 to 4.56 (range 1-5), indicating high satisfaction. The highest scoring items included that the facilitators made them feel welcome, comfortable, and seemed concerned about their well-being. The lowest scoring items involved the ease of fitting the group into the participants' schedule and dealing with stress. All participants that completed the survey reported that they planned to continue to participate in future iterations of the program. Participants who attended at least 25% of both the SMVs and SMS visits also reported that they appreciated the additional time they had with their medical provider; the team-based approach including the utilization of a behavioral health clinician, nutritionist and a nurse trained in self-management; the opportunity to explore their difficulties with managing their diabetes self-care; and the opportunity to work on coping, problem solving, and goal-setting skills. Participants reported, anecdotally, that they did not care for a distinct sequence or separation of topics, and often asked questions about a variety of topics at each visit. Participants seemed to understand self-care activities, but struggled with coping and resolving existing psychosocial and behavioral issues that interfere with the establishment of behavioral routines and habits.

The staff also reported an overall positive experience throughout the program, with satisfaction scores ranging from 3.67 to 4.67 (range 1-5). Notably, most staff reported lower

satisfaction with the efficiency of the visits, as they did not decrease no-show rates or improve the ability to manage patients with diabetes. The highest scoring items included the opportunity to learn from the participants, their impression of participant satisfaction, and their interest in continuing with this health care format. Participant satisfaction scores are listed in Table 6 and staff satisfaction scores are in Table 7.

Discussion

Attendance was the most significant challenge to full implementation of the program. The benefits of SMVs come from the interaction within the group, and optimal group size (about 6-10 participants) is important to promote group support (Bloomfield & Rising, 2013; Edelman et al., 2012). Despite a systematic and automated approach for scheduling and recalls, only one in three participants attended regularly (not always the same individuals). In a meta-analysis on group interventions, average attendance rates for diabetes groups was approximately 50% (Jaber et al., 2006). It has been suggested that no-show rates increase proportionally to the number of appointments (Kaplan-Lewis & Percac-Lima, 2013) and to the duration of the program, suggesting that program duration of 5 months or less would significantly improve attendance (Steinsbekk, Rygg, Lisulo, Rise, & Fretheim, 2012).

In a study on no-show rates in a primary care setting, forgetfulness and miscommunication were major reasons for missing appointments (Kaplan-Lewis & Percac-Lima, 2013). In a recent systematic review of patient-reported reasons for not attending structured diabetes education visits, logistical, medical, financial, emotional, and cultural reasons were cited as barriers to regular attendance, as well as the notion that the educational visit would not provide any benefit or new knowledge to the participant. This analysis also noted that 80% of

non-attenders were male and suggests that diabetes education should be gender specific (Horigan, Davies, Findlay-White, Chaney, & Coates, 2016).

Attendance may also be influenced by how well a group comes together. Those that don't identify with the group may choose not continue to attend. Group cohesion is essential in the early stages of group visits and may be affected by how members identify with other members of the group, and the different rates at which group members adapt new knowledge and skills in order to change how they manage their health conditions. This may be addressed by providing additional support to individuals along the continuum of the change process, as well as through the use of group activities (Thompson, Meeuwisse, Dahlke, & Drummond, 2014).

Clinical Implications

Multiple studies have shown that group visits, combined with self-management support, can improve clinical outcomes, and Centering offers a supportive model of group process. The duration of the intervention may have affected the overall attendance of the intervention. It is reasonable to consider that creating a shorter SMV program, with less overall number of visits and more personalized self-management support, that doesn't start before major seasonal holidays, could improve attendance and clinical outcomes. Future approaches are being considered that would reduce the overall length of the program to eight weeks, with weekly SMVs throughout. Using a mobile app that provides reminders and individualized coaching support with interactive communication capabilities may also enhance participant engagement. This approach has shown a lot of promise in a recent diabetes prevention program that utilized text message support to promote weight loss in a Spanish speaking population (Fischer et al., 2016).

In light of the change of reimbursement models to alternative payment models like Merit-based Incentive Payment Systems under the Medicare Access & CHIP Reauthorization Act of 2015, SMVs, combined with SMS, offer a way to extend the ability of a PCP to manage patients with diabetes and behavioral health issues in a busy community health setting. Although one analysis did not find increased attendance rates from financial incentives or penalties imposed by insurance for non-attendance, financial incentives to improve clinical outcomes measures and reduce costs in a pay-for-performance reimbursement models will likely focus increased attention to group visits in the future (Horigan, Davies, Findlay-White, Chaney, & Coates, 2016). In our setting, using the integrated, inter-professional approach to group visits for diabetes management garnered increased interest among staff in applying it to other topics, such as smoking cessation or weight loss/obesity group in adults or children and their caretakers. After addressing the issue of attendance, this format could also be expanded to other chronic health conditions, such as chronic obstructive pulmonary disease, congestive heart failure, or obesity.

Conclusion

The implementation of SMVs for adults with diabetes, using a facilitative format involving the Centering[®] Healthcare Model's Essential Elements, the AAD7, and additional support for coping, problem-solving, and goal setting, was perceived as a welcome alternative to traditional care by both participants and staff. Further research on creative approaches to improving SMV attendance in a medically underserved population is needed. Attendance could be improved by shortening the overall length of the program, providing brief intensive programs throughout the year, and considering alternative methods for self-management support.

Tables

Table 1: Elements of a successful group visit

Presence of a prescribing clinician
A consistent clinical leader
At least three clinical team members present
A closed group of participants
Group size of 6-10
Brief individual time with the clinician
Evaluation of medications
Group duration of 90–120 minutes

(Edelman et al., 2012; Eisenstat et al., 2013)

Table 2: Centering® Essential Elements

<p>Health Assessment happens in the group space.</p> <p>Patients engage in self-care activities.</p> <p>Each visit has a plan, but emphasis may vary.</p> <p>Groups are facilitated to be interactive.</p> <p>There is time for socializing.</p> <p>Groups are conducted in a circle.</p> <p>Group members, including facilitators and support people, are consistent.</p> <p>Group size is optimal for interaction.</p> <p>There is ongoing evaluation.</p>
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Table 3: Key components of a SMV

Component	Activity	Time
Introduction	Centering activity, introduction of topic/content	5 min
Self-assessment	Topic/content based self-assessment	30-45 min
Topic discussion	Facilitated group discussion of visit topic, group activities	60 min
Provider time	Individual meeting of participant and medical provider	15 min
Closing	Centering activity, reminder of next visit	5 min

Table 4: SMV topics based on AADE7 guidelines

Visit	Topic/content
1	Introduction, Problem Solving
2	Healthy Eating
3	Taking Medication
4	Blood sugar monitoring
5	Be Active
6	Know your ABC (Hemoglobin A1 _c , Blood Pressure, Cholesterol)
7	Reduce Risks
8	Closing, Healthy Coping

SMV: Shared Medical Visit, AADE: American Academy of Diabetic Educators

Table 5: Participant demographics

Total (N)	12
Age	52.5 (range 38-69)
Gender	Female 4 (33%), Male 8 (67%)
Race/ethnicity	Caucasian 5 (42%) Black 3 (25%) Hispanic 4 (33%)
Insurance	Medicaid 10 Medicare 2
Baseline (average)	A1c 8.3, BP 135/83, BMI 33.9, LDL 118.7

Table 6: Participant Satisfaction

		Score (SD) Score 1-5
Q1	Overall satisfied with SMV	4.44 (0.68)
Q2	Easy to fit into schedule	4.22 (0.78)
Q3	My doctor spent more time	4.33 (0.68)
Q4	I have learned much	4.44 (0.68)
Q4a	Monitor DM	4.44 (0.68)
Q4b	DM meds	4.44 (0.68)
Q4c	Eat well	4.44 (0.68)
Q4d	More active	4.44 (0.68)
Q4e	Deal with stress	4.22 (0.78)
Q4f	Set realistic goals	4.44 (0.68)
Q4g	Reduce risks from DM	4.44 (0.68)
Q5	Good clinical care	4.44 (0.68)
Q6	SMS helped meet goals	4.44 (0.68)
Q7	Facilitators helped me feel welcome and comfortable	4.56 (0.68)
Q8	Facilitators seemed concerned about my well-being	4.56 (0.68)
Q9	I plan to continued to participate in SMV/SMS	4.33 (0.81)

SMV: Shared Medical Visit, DM: Diabetes, SMS: Self-Management Support visit

Table 7: Staff Satisfaction

		Score (SD) Score 1-5
Q1	I am overall satisfied with the Shared Medical Visits (SMV).	4.17 (0.68)
Q2	The SMV are easy to plan and carry out.	4.33 (0.47)
Q3	The SMV are an effective way to help me care for my diabetic patients.	4.50 (0.50)
Q4	The SMV provide effective clinical care (as measured by improved health care outcomes).	4.50 (0.50)
Q5	The SMV provide efficient clinical care (as measured in decreased no-shows or cancelled appointments, and ease in panel management).	3.67 (0.74)
Q6	The SMV add value to my work or clinical practice.	4.33 (0.74)
Q7	I have learned much from the participants during the SMV.	4.67 (0.47)
Q8	The participants enjoyed coming to the SMV.	4.67 (0.47)
Q9	I plan to continue to participate in SMV after this study.	4.67 (0.47)

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