

Comparisons of Health Education, Group Medical Care, and Collaborative Health Care for Controlling Diabetes

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Abstract

Introduction: This article presents early-phase clinical investigations into how to care for people with diabetes mellitus (DM) in an outpatient setting, focusing on efforts at improving care for Native Americans using conventional and nonconventional interventions—in particular, whether engaging people with DM using culturally specific and spiritual methods were more effective in reaching several DM management goals than conventional methods alone. This outreach may be seen as an example of delivering culturally competent medical care, a prime objective of family medicine.

Methods: In a three-year, serial process, three interventions included: diabetic health education, group medical care for diabetes, and shared collaborative care, which included medical, psychological, and spiritual care provided simultaneously.

Results: In all clinical outcome data—multiple measures of glucose control—statistically significant differences were found between shared, collaborative care and group medical care, and also between these and standard health education and conventional care.

Discussion: Several potential explanations are offered, with discussion, for how shared, collaborative care can be more helpful than group care or individualized care alone, including: stress reduction, increased social support, producing more positive health beliefs, and acting as a kind of naturalistic biofeedback.

Introduction

This article presents some early-phase clinical investigations into how to care for people with diabetes mellitus (DM) in an outpatient setting, focusing on my efforts at improving care for Native Americans using

conventional and nonconventional interventions. In particular, I examined whether efforts at engaging people with DM using culturally specific and spiritual methods were more effective in reaching several DM management goals than conventional methods alone. This outreach may be seen as an example of delivering culturally competent medical care, a prime objective of family medicine.

DM is a major health problem that is exploding in pandemic proportions.^{1,2} Certain ethnic or cultural groups have a particularly high prevalence of DM. The Pima (a South Central Arizona tribe), who have a prevalence of type 2 DM of >60%, are an example of this.³ As more than half of my practice consists of people of Native American ancestry, I wished to improve my efficacy in helping people control their DM.

The incidence and prevalence of DM are rising in much of the world. Health inequalities in developed countries may explain some of that rise.⁴ Increasing insecurity regarding housing, income, and food may correlate with increasing prevalence of type 2 DM.⁵ For this reason, purely medical approaches to DM or even educational approaches may not be as successful as approaches that simultaneously address medical, psychological, and spiritual aspects of life with DM. This is all the more relevant because stress can stimulate hyperglycemia.⁶⁻⁹ Among adults with type 2 DM using daily stress diaries, blood glucose levels tended to be higher on high-stress days and lower on low-stress days, suggesting that stress does have a hyperglycemic effect in the natural environment,¹⁰ a finding paralleling the commonsense assessment of many clinicians. A study in Zagreb failed to demonstrate an association between the stress of displacement during the first eight months of the armed conflict in Croatia and metabolic control

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of patients with DM.¹¹ Coping styles and other covariates, however, were not considered in this assessment, so how we cope with the challenges of our lives may be more important than what those challenges are. At 12-year follow-up evaluations, brittle DM almost always relates to a situation-specific stress, usually unhappiness at home or school. Blood glucose level tends to improve once the underlying stressful life circumstance changes or improves. When the underlying life event does not change and unhappiness continues unabated, the medical prognosis is poor.¹² Longer clinical visits are also needed for people to become able to communicate about their difficult situations and to even conceptualize that life could change.

An approach to care that combines medical, psychological, and spiritual care to generate stories for behavior and lifestyle change could be very helpful for people with DM because these factors interact and overlap. If participants with DM can learn better means for managing stress and negotiating their lives, measures of DM control may improve. Typically patients have stories to explain or justify unhealthy behaviors, and eliciting these stories often requires longer contact time than the usual medical office visit. Without changing these stories, health behavior rarely changes.

Group care long has been used as a means of affecting the symptoms of medical conditions in situations as diverse as asthma, DM, and cancer.¹³ Community interventions that encompass a wide range of activities in a variety of settings offer greater potential for promoting lifestyle change.^{3,14,15} Exchanges of community resources that tap into local educational, medical, social, and lay expertise to address DM may take different forms, be they formal or informal, unidirectional or multidirectional. Collaborative partnerships between community entities are coherent with an ecologic perspective that stipulates a multilevel, multidisciplinary approach to health promotion.¹⁶

Methods

This pilot project aimed to explore three models for providing care to patients with DM. The models were introduced into my practice sequentially. The logic behind the sequence consisted of a search for the most effective way to improve measures of control, with awareness of the limitations of the approach being used at the time and an improvement. A high proportion of my clientele consisted of Native Americans. First, I tried introducing diabetic health education for one year. Then I tried group medical care for DM for one year. Third, I implemented shared collaborative care,

which included medical, psychological, and spiritual care provided simultaneously. The rationale was to improve DM control. Each intervention suggested its successor in a continued attempt to maximize effectiveness. Unfunded, community-based research in actual practice settings like that which I am presenting may have advantages over the randomized, clinical trials conducted in academic medical centers, because these settings more closely resemble the venues in which most physicians practice. The patients presented here may be more representative of those encountered by community physicians than those in academic centers. We may also learn much that can guide clinical trials.

Patient Selection

No exclusions of any person with type 2 DM were made, as this was a clinical pilot study in a community-based setting. Participants were referred by me, a nurse practitioner, a community-health nurse, or by others in the community.

Initial Patient Assessment

Participants underwent the following procedures:

- *Medical history and physical examination*
- *Timeline health history*, including family medical history, social history, and treatment checklist form. The timeline health history obtains dynamic data on perceived quality of life and behavior over the past two years. It measures patient perception of anxiety, self-esteem, cigarette smoking, drug use, alcohol use, quality of diet, work stress, perception of general health, personal stress, family support, support of friends and community, relationship quality, levels of depression, activity levels, and exercise levels. Diet was assessed with a 24-hour diet recall to obtain information on nutritional status. We used the Food Processor II software (version 3.0, ESHA Research, Salem, OR, USA) to determine nutritional intake.
- *Laboratory studies*, including glycosylated hemoglobin (HbA_{1c}), lipid profile, complete blood count, urinalysis, and basic chemistry panel.

Health Education

Standard American diabetes education was provided in addition to conventional medical care. I employed a diabetes health educator to provide these classes.

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Group Medical Care

For group medical care, participants came at the same time and had their medical care visit together as a group. This visit included discussion of symptoms and concerns, adjustment of medication, weights and measurement, and health education. When anyone needed an examination that required privacy, this was conducted individually after the end of the group visit. I provided these services and offered all of my patients with type 2 DM the opportunity to come on the same day at the same time and create a community around DM.

Shared Care Intervention

For shared care intervention, participants came at noon for a meal. I worked with a traditional spiritual elder for the period from noon to 3 or 4 pm. We focused on the nutritional, the medical, the psychological, and the spiritual. The group began with group medical care, as in the first format, followed by a problem-solving group and then by specific targeted interventions. Being both a family physician and a psychologist, I had both skills sets and so provided care in both formats. Specific interventions included a talking circle, practice in recognizing stress, focus on increasing social networks, practice of relaxation and meditation skills, journaling, focus on improved coping skills, informa-

tion on alternatives for cravings, telling our stories, using guided imagery, recognizing health beliefs, social skills training, and visualization to improve self-esteem. Education exercises concerned physical activity, dietary modification toward a traditional Native American diet, and building social networks.

I obtained the standard laboratory tests at the standard intervals recommended by the American Diabetes Association whenever possible. I report these results here. I also kept track of the stories told in our meetings and of my experience of participating (reflexive methodology and intuitive inquiry). It occurred to me that the best interventions would engage participants and leaders maximally and would be fun.

Results

Table 1 presents the characteristics of the patients attending my optional additional care sessions during the three years of the study. The population for each intervention was not very different. Once patients had settled into an intervention, it was not changed when a new intervention was offered, unless they asked, which no one did.

Table 2 presents the results of my patients for their first six months of participating in each study condition. Clearly, standard of care plus health education in my practice setting was associated with slow deterioration. I wanted to understand this, so I sat in on several education sessions and found that they were uninteresting. My patients shared that nothing was happening, and most stopped going. Hiring a diabetes health educator did not appear to be very helpful.

Group Medical Care Versus Standard Health Care Plus Health Education

Group medical care was much more enjoyable than standard care plus health education. We (the nurses and I) looked forward every week to “diabetes afternoon.” We enjoyed the patients with DM so much more than we had when providing standard care. We could have spent up to four hours together with our patients with DM every week, though most people came less often than weekly and many came late or left early. In group care, I learned their stories. I learned about their families, their hopes and dreams, their fears. In addition to taking blood pressures, measuring glucose, and performing the other instrumental activities of medical care, we shared our lives. I enjoyed teaching them how to take blood pressures and how to check urine for sugar. The participants felt an increased sense of empowerment about their health care from the stories

Table 1. Study sample characteristics

Characteristic	Health education	Group medical care	Shared care
Demographics			
Men/women	19/23	21/19	25/22
Age in years (SD)	45.4 (8.8)	50.9 (6.5)	49.6 (7.8)
Income in thousands (SD)	14.6 (15.8)	17.12 (16.93)	15.86 (20.89)
Years of education (SD)	11.2 (3.7)	10.3 (4.0)	10.9 (2.6)
Years married (SD)	18.3 (9.1)	19.5 (13.7)	23.6 (9.4)
Percentage Native American	80	78	72
Years of illness (SD)	6.75 (4.01)	6.54 (4.86)	6.23 (3.45)
Medication			
None	8	4	5
Oral	40	32	35
Insulin	9	8	8
Physical measures			
HbA _{1c} ^a (SD)	7.08 (1.2)	7.05 (0.98)	7.20 (0.99)
BMI ^b (SD)	30.72 (4.89)	30.33 (4.27)	30.60 (4.57)

Note: Data are means and standard deviations (in parentheses) unless otherwise specified.

^aHbA_{1c} = glycated hemoglobin, a measure of glycemic control over a three-month period. American Diabetes Association criteria for adequate clinical control is <7.

^bBMI = body mass index, an indirect index of adiposity in adults. Scores from 18.5 through 24.9 indicate normal weight for adults, according to National Heart, Lung, and Blood Institute clinical guidelines.

SD = Standard deviation

Variable	Health education	Group medical care	Shared care
Glycated hemoglobin (HbA _{1c}), value percentage points	0.6	-0.4	-2.1
Mean fasting blood glucose level, mg/dL	0.4	-28.3	-42.8
Systolic blood pressure, mmHg change	1.5	-9.0	-13.5
Diastolic blood pressure, mmHg change	1.7	-3.4	-5.1
Weight, kg change	0.3	-1.2	-2.4
Low-density lipoprotein level, mg/dL change	8.1	-16.2	-24.3
High-density lipoprotein level, mg/dL change	-1.3	2.6	3.9
Serum triglyceride levels, mg/dL change	11.2	-22.4	-33.6
Arizona Integrated Outcome Score change	0.00	0.7	1.05

All measures of group medical care and shared care are statistically significantly different from health education at $p < 0.05$ or better, and all measures between group medical care and shared care are also significant at $p < 0.05$ or better.

related to me. They enjoyed the sense of camaraderie and fun that group care provided. Sometimes family members would come and participate in group care; all were welcome.

Health education was primarily a one-way street. Participants were taught facts about DM and told how to manage their DM. Their participation consisted of asking questions that were answered by the educator. No new stories emerged. The stories presented were those of conventional DM care.

In group medical care, more interesting stories emerged. Patients had time to talk about their lives and difficulties with DM. We were able to see emergent themes of the stories being told by group members, including how to approach common problems shared by participants. These common issues included how to exercise; whether to exercise; what to eat; when to eat; how to cook; how to manage stress; and life issues, such as money problems, problems with children and parents, marital problems, sexual problems, and work problems. Group care gave time for discussion.

Shared, collaborative care was most effective (Table 2) and was also the most enjoyable. All present enjoyed the shared meal. We learned about traditional Native American foods, how to cook them, and how good they could taste. Sharing care with the elder (Nick) provided an added dimension of richness and spirituality. Prayer entered into our deliberations, along with the occasional ceremony. Additional discussions focused on what constituted "Indianness" and how to cultivate it. The elder added the perspective of traditional stories, traditional foods and activities, and cultural identification.

What differed about group care and shared care from conventional health education was the lack of much specific discussion about facts and DM. Mostly we shared our lives and what mattered to participants. We brainstormed about how to help each other. We prayed

for each other. We talked about how to live a lifestyle more like our ancestors. The spirit was collaborative and supportive. In this sense it was culturally sensitive to Native American patients (I am also Native American).

Patient Narratives

"I found out I had diabetes ten years ago, and I don't know how long I had it before that. I was having dizzy spells. I went in and saw the doctor and found out I had it. He gave me medicine and [a] program, but it was hard to follow what he told me to do. I didn't have anyone to walk with and I just didn't feel like walking alone. When I tested my sugar, it was usually high. When I started coming here and spending time with the doctor and Nick [the traditional healer], I took my sugar three times a day and started walking. It slowly came down. I knew it was working. Sometimes some of the guys who come here also walk with me. Now my sugar is usually okay. I also take some of those medicines that the traditional healer brings. He gave me some rat root, which he said is good for diabetes. We pray together too, and that sure helps. I take some arthritis medicine from the healer too. I don't need a knee replacement. He smudges me and doctors my knee, and that really helps also. I respect traditional medicine. I'm glad you got Nick to come over. My wife takes traditional medicine for arthritis and for her sugar too. Her sugar is stable too. Sometimes it gets too low if she doesn't eat."



"I came here because I wanted to try different ways. For my diabetes, I need to exercise. I can't exercise right now where there's too much ice outside. I don't want to end up with broken bones. They got a treadmill here that we use. As far as my arthritis

goes, that's what fixed me up. I take traditional medicine for my circulation too. I been doing this for a while. Some people keep track of how long they quit drinking or smoking, but I don't. When you sit with that Nick, you have to exercise and pray. You have to pray when you take his medicines because that's what makes it work. I wouldn't do things that didn't work. It's good Nick works together with the doctor. That's good. Nick said to keep taking my diabetes pills. I wanted to just throw them away. I like coming to the meetings because I've been lonely since my wife died. My kids come around, but I need old people my age too. Those kids just don't understand what we old people have been through. It's good to have people here who will listen. My arthritis and my joints were sore too. Sometimes I couldn't hold a glass of water. One time I couldn't walk out of the Bingo Hall. I had to have someone go get my cane. Now I use it to fight off dogs or something when I go for walks. I don't really need it. That's what I say to people who carry canes. I think having more time with other people is really helpful."

An important distinction now being made in stress research is between life events that can potentially be stressful and the levels of stress actually perceived by the person experiencing the stress.

Discussion

Clinical outcome data showed the greatest benefit coming from shared, collaborative care, followed by group medical care, followed by standard health education and conventional care. A MedLine search revealed no other studies combining nutritional, medical, psychological, and spiritual care for Native Americans with DM. The collaborative intervention also allowed for more culturally competent care in that it was easy to integrate the traditional elder into the medical and psychological care in a way that patients appreciated.

Timewise, I usually spent 15 minutes on an individual appointment with a patient who had DM, plus the cost of a diabetes health educator. Group care improved on that by including more than eight people every other week for two hours. Shared care was most popular with patients and me. Shared care did not improve on the efficiency of group care, but more people came each time it was offered. Plus, I found it stress-reducing and very enjoyable. To equal standardized care, I needed 12 people to come to each session. Invariably there were more. Normally I would have been alone during my lunch hour. In this format, I ate amazing food with a group of people about whom I cared.

Both group care and collaborative care could be classified as encompassing social science interventions to enhance the effectiveness of medical practice.¹⁷ Cousins exist to our collaborative care and/or group care interventions including Noffsinger's¹⁸ drop-in group medical appointments (DIGMAs). He showed that the use of DIGMAs substantially leveraged physician time, improved accessibility at both the individual physician and the departmental levels, increased quality of care by better addressing patients' mind-body needs and improving follow-up care, achieved high levels of patient and physician satisfaction, and reduced costs to the organization by leveraging existing staffing resources:

*DIGMAs enable physicians to see dramatically more patients in the same amount of time but in a way that increases patients' satisfaction with their health care and physicians' professional satisfaction while improving service and quality of care. DIGMAs offer an extended medical appointment with the patient's own doctor in a group visit setting that enhances the patient's care experience. The increased efficiency that DIGMAs provide can be used both to enable physicians to better manage their large practices and to improve the customer focus of the organization. Although still quite new, the DIGMA concept is already beginning to gain attention and recognition.*¹⁸⁻²⁰

Questions arise as to how shared, collaborative care can be more helpful than group care or individualized care alone. One of several potential explanations includes stress reduction. The occurrence of recent, potentially stressful life events was associated with worsened DM control.^{16,21-26} Collaborative medical care could help reduce the impact of stressful events more than group medical care or DM health education. An important distinction now being made in stress research is between life events that can potentially be stressful and the levels of stress actually perceived by the person experiencing the stress. In one study of patients with insulin-dependent DM between the ages of 16 and 65 years,²⁷ higher levels of perceived stress (but not daily hassles) were associated with poorer diabetic control. Emotional stress (a concept similar to perceived stress) has also been linked to poor DM control.²⁸⁻³⁰

Collaborative care could also increase social support. Decreases in social support predicted a worsening of longer-term (HgA_{1c}) DM control over time.³¹ Patients who perceived they had more social support experienced better control of their DM.³² Other fac-

tors that have been linked to glucose control include self-concept,³² global emotional disturbance,³³ and personality characteristics.³⁴ Depression has not been associated with compliance or metabolic control.³⁵ Collaborative care theoretically provided greater opportunities for enhanced self-concept, management of emotional disturbance, or emotional support.

Collaborative care could also help produce more positive health beliefs. Harris and Linn³⁶ showed that health beliefs were minimally associated with compliance and strongly associated with control in a group of men with DM. Others^{37,38} have observed that there is often a lack of agreement between compliance and diabetes control. Clinicians who work with patients with DM have seen those who fail to achieve control despite dedicated compliance with therapeutic regimens. Harris and Linn's study participants were mostly middle-aged, obese men, all of whom had had DM for nearly ten years. They were not very compliant. Even in the face of noncompliance, these men averaged monthly visits to the outpatient clinic and had relatively positive health beliefs. Harris and Linn found that the men's health beliefs had a positive impact on control separate from compliance. They noted that the intervening variable between beliefs and control is usually assumed to be behavior (compliance). Instead, it appeared that the attitudes that treatment could help, that symptoms called for seeking treatment, that susceptibility to diabetic complications was low, and that family support was important were associated with better metabolic control. Perhaps a positive attitude produces less anxiety and stress, affecting control through the mediation of these variables. Excessive anxiety is associated with inaction,^{39,40} and anxiety and stress have been related to decreased insulin production.⁴¹ These studies underscore the importance of considering attitudes and beliefs about DM and the interaction of these factors with other variables that have longer been considered important. Collaborative care was perhaps more able to manage these less specific factors that are affecting DM.

Collaborative care may provide a kind of naturalistic biofeedback. Case studies have been reported in which biofeedback-assisted relaxation techniques have been used to improve glycemic control. One young woman with a ten-year history of insulin-dependent DM was helped to achieve better control through improved stress management.⁴² Another case report described a female patient with unstable type I DM whose average blood glucose levels improved

significantly and were maintained by the one-year follow-up evaluation with a constant or slightly decreased insulin dose.⁴³

Certainly, the richest stories in my study emerged in shared care. The time commitment for all three groups was about the same, but in standard care, participants went to medical care separately from health education and had to seek spiritual care and psychological care on their own. This separation of services made people less likely to use all potential services. Group medical care enriched the dialogue and combined education and medical services with some additional psychological services. Shared care provided the greatest integration. On the surface, shared care appeared to be the most time intensive because all services occurred in the same setting.

I offer this as an invitation to other physicians to venture outside of the usual ways that we provide care and to consider that other approaches may be more health effective—and may also be soul-saving for the physician. Many of us have lost sight of the joy of human interaction. Shared care and group care restored that for me. ❖

Disclosure Statement

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