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Keys to Successful Diabetes Self-Management for Uninsured Patients: Social Support, Observational Learning, and Turning Points A Safety Net Providers' Strategic Alliance Study

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Abstract

Objective—To determine how medically uninsured patients with limited material resources successfully manage diabetes.

Methods—Clinicians at 5 safety net practices enrolled uninsured adult patients (N=26) with prior diagnosis of diabetes for 6 months or longer. Patients were interviewed about enabling factors, motivations, resources, and barriers. Chart reviews and clinician surveys supplemented interview data. Interview, survey, and chart review data were analyzed and findings were summarized.

Results—Two distinct groups of patients were investigated: 1) "successful," defined as those with an HbA1c of ≤7% or a recent improvement of at least 2% (n=17); and 2) "unsuccessful," defined as patients with HbA1c of ≥9% (n=9) without recent improvement. In comparison to unsuccessful patients, successful patients more often reported having friends or family with diabetes, sought information about the disease, used evidence-based self-management strategies, held an accurate perception of their own disease control, and experienced "turning point" events that motivated increased efforts in disease management.

Conclusions—Uninsured safety net patients who successfully managed diabetes learned from friends and family with diabetes and leveraged disease-related events into motivational turning points. It may be beneficial for clinicians to incorporate social learning and motivational enhancement into diabetes interventions to increase patients' motivation for improved levels of self-management.

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Conflict of Interest Statement:

None of the authors (Hanahan, Tomsik, Weirich, Reichsman, Navracruz, Cella, Clark, Terchek, Munson, Werner) report any potential, perceived, or real competing conflicts of interest.

Keywords

diabetes; self care; self-management; social support; comorbidity; turning points

Introduction

The prevalence of type 2 diabetes continues to soar across all U.S. social strata,[1] but the disease disproportionately affects low income, minority, and medically uninsured patients, many of whom obtain care at safety net clinics.[2] Members of racial and ethnic minority groups are at increased risk for diabetes,[3, 4] with the rate for non-Hispanic African Americans and Mexican Americans almost twice that of non-Hispanic whites.[5–7] Lack of health insurance has been identified as an independent risk factor for poor outcomes in diabetes and is most prevalent in low income populations.[8,9] Behavioral risk factors for diabetes include poor quality diet, inadequate exercise, limited medication adherence, and depression,[10,11] all of which are common among poor, medically uninsured patients.[12]

These risk factors make apparent the need for front line safety net clinics to equip medically uninsured patients to self-manage diabetes.[13,14] Patients with diabetes typically provide about 95% of their own care,[15] and effective diabetes self-management has been shown to significantly improve health outcomes.[16,17] The complications of diabetes can be often be reduced with appropriate health care and education in self-management.[18]

Central to self-management is the adoption of lifestyle modifications including regular self-testing of blood sugar, strict dietary monitoring, regular exercise, and proper medication regimens,[19] while building control and self-efficacy.[20] However, low-income, uninsured diabetes patients have limited financial resources that constrain their ability to pay for diabetes testing supplies, fresh foods, and medical visits. Prescription medications and diabetes supplies account for nearly 70% of out-of-pocket expenditures among U.S. adults with diabetes, more than for any other common chronic medical condition.[21] Low-income patients often live in built environments that are unfavorable to exercise,[22] limit control over social conditions,[23] and deter the development of self-efficacy.

Despite these systemic limitations, a proportion of low-income, uninsured diabetes patients successfully self-manage diabetes consistently over time. This study was conducted to ascertain key factors that enable such individuals to effectively manage their disease in the face of limited resources and unfavorable environments. We compared and contrasted the experiences, perspectives, and strategies of uninsured safety net patients who maintained or improved glycemic control with those of uninsured diabetes patients with chronically-elevated glycemic levels. This is a follow-up investigation prompted by the findings of a study conducted in the Safety Net Providers' Strategic Alliance (SNPSA) practice-based research network (PBRN) in which patient-reported barriers and opportunities to diabetes care and self-management were identified.[24]

Methods

This was a cross-sectional, interview-based study of established patients with type 2 diabetes from five urban primary care safety net practices within the SNPSA PBRN. The SNPSA is a consortium of urban safety net practices located in greater Cleveland, OH, USA. The PBRN's Steering Committee members, medical directors, and clinician-leaders of SNPSA-member practices collaborated with academic investigators to design the study and invited other primary care clinicians within the SNPSA to voluntarily participate. Data were collected from June 2006 through February, 2007. Approval to conduct the study was granted by the Institutional Review Board of Case Western Reserve University.

Procedures

Patients were recruited from SNPSA practices for participation. Recruitment methods were dependent on resources available at each clinic. Three Federally Qualified Health Centers used existing diabetes registries to identify patients; two free clinics did not have registries and identified eligible patients as they presented for care. Participating clinicians gave permission for eligible patients to be contacted about the study. Each participating patient was offered a $15 supermarket gift card.

Eligible patients were 18 years of age and older, medically uninsured for 6 months or longer, English-speaking, and had a diagnosis of type 2 diabetes for 6 months or longer. Cognitively impaired patients were excluded from the study. Each site identified "successful" patients who met a key diabetes control benchmark and a smaller comparison group of "unsuccessful" patients who did not meet these criteria. Successful diabetes management was defined by the investigators as documented improvement of 2.0 percentage points or more in HbA1c levels within six months of the interview date, or a most recent HbA1c level of 7.0 or less, representing a stable or improved value for six months prior to the interview date. Unsuccessful management was defined as a most recent HbA1c level above 9.0 within six months of the interview date, without improvement during that time.

Measurement

After providing written informed consent, each patient participated in a 30- to 45-minute semi-structured interview conducted by one of the investigators (MAH). Domains addressed in the interview were barriers to diabetes self-management, resources available to the patient, self-management methods and strategies, and personal enabling factors. For example, the following question was asked to assess self-management methods and strategies, "How do you know when your diabetes is under control?" SNPSA clinicians completed a brief survey about participating patients' adherence to treatment plan, degree of diabetes control, and disease severity. Additionally, the following data elements were obtained through chart abstraction: patients' HbA1c levels over the past six months, number and type of diabetes medications prescribed, number and type of co-morbid conditions, and confirmation of study eligibility.

Interviews were audio recorded and transcribed. Qualitative data analysis techniques were used to systematically determine the meaning of the interview data. A set of *a priori* codes

were derived from the research questions while other codes were emergent, permitting the analytic process to be both conceptually-driven and inductive. Raw interview data were tagged with codes to denote common meaning using *Atlas.ti v5.2* data analysis software. Two coders were used to decrease individual bias, to ensure reliability, and to clarify the meaning of the codes.[25]

Data for successful and unsuccessful patients were summarized and displayed within data matrices that facilitated recognition of patterns.[25] Finally, the process of immersion/crystallization was used to identify themes at higher levels of abstraction. This technique complemented the other analytic methods and consisted of prolonged immersion into the data to facilitate deeper levels of understanding.[26] Investigators and SNPSA clinicians engaged in multiple readings of the text and commented on data summaries, both individually and collaboratively. This permitted emerging themes to be co-created, critically evaluated, and confirmed or disconfirmed.

Results

A total of 17 successful patients and a comparison group of 9 unsuccessful patients were recruited at 5 safety net clinics. Mean age of all patients was 50.6 years and 65.4% of participants were female. African Americans comprised 57.7%, whites 38.5%, and Hispanics 3.9%. Overall, 38.5% were high school graduates and 42.3% had post-high school education. The majority of participants were unemployed (73.1%).

Table 1 summarizes participants' glycemic control, disease history, and self-management behaviors. As expected, the median HbA1c for the successful group was substantially lower than for the unsuccessful group (6.5 vs. 10.2). Patients in the successful group more often reported having a diabetes diagnosis for fewer years than those in the unsuccessful group (median 6.0 vs. 14.0 years), and more commonly reported having family members with diabetes (82.4% vs. 55.6%). A smaller proportion of successful patients were using insulin than unsuccessful patients (41.2% vs 77.8%). A greater share of successful patients had participated in diabetes group visits (35.3% vs. 22.2%) and visited their health care provider in the past 12 months (median 7.0 vs. 6.0). Successful patients had fewer co-morbid conditions than unsuccessful patients (median 2.0 vs. 3.0).

Patients in the successful and unsuccessful groups were similar in knowledge of their most recent HbA1c test value (41.2% vs. 44.4%), the estimated frequency of blood sugar checks per day (median 2.0 vs. 2.0), the number of prescribed diabetes medications (median 2.2 vs. 2.0), and body mass index (median 34.3 vs. 32.5).

Table 2 shows clinicians' assessments of individual participants' adherence behavior, disease severity, and level of diabetes control. Data was captured for less than the full sample of patients (20 of 26) due to difficulty reaching physicians. Compared to unsuccessful patients, patients in the successful group were rated as having better adherence to medication, follow-up visits, and lifestyle recommendations. Clinicians rated unsuccessful patients' as having more severe diabetes and lower levels of diabetes control than successful patients.

Themes emerging from the semi-structured interviews with participants are provided in Table 3. In contrast to unsuccessful patients, successful individuals commonly cited having supportive family members with diabetes who were role models. These individuals enabled the patient to learn about diabetes and self-management techniques. Family members either role modeled the benefits of managing diabetes or served as examples of the perils of poor self-management practices. Successful patients also reported having supportive friends who served as allies in diabetes management more commonly than unsuccessful patients. Successful patients tended to use evidence-based strategies for managing diabetes whereas unsuccessful patients seldom reported using empirically-tested strategies, instead relying to a greater extent on physical symptoms to assess disease control. Successful patients more often took action to seek out information about diabetes self-management from sources such as the Internet and libraries and more often participated in educational group visits; this was less common for unsuccessful patients. The self-perception by successful patients' of diabetes control closely matched their most recent HbA1c test result; unsuccessful patients tended to report more favorable control than indicated by HbA1c. Successful patients more frequently reported experiencing a life-changing turning point event that motivated them to higher levels of self-management, in contrast to unsuccessful patients who seldom reported that diabetes-related events evoked greater self care.

Discussion

This study is significant because it identifies key differences in diabetes-related characteristics of medically uninsured patients who successfully managed their disease compared with those who were less successful. These differences point to protective factors that are largely independent of the health system resource limitations faced by all patients in the sample. Protective factors include diabetes-specific role modeling and social support, efficacy in using evidence-based strategies, accuracy in self-perception, and the capacity to identify key turning points.

Patients in the successful group more commonly cited the presence of a diabetic family member who influenced their approach to diabetes management. Patients reported that prior exposure to the disease prepared them to understand their condition, to take it seriously, and to manage it more successfully. The extent to which the family member controlled his or her own disease did not appear to influence successful patients' level of self-management success. This may be the result of observational learning,[20,27] in which diabetic family members served as behavioral models. In accordance with social cognitive theory, patients learned vicariously about diabetes from family members and formulated their own self-management beliefs and behaviors either similarly or dissimilarly, depending on family members' disease processes and outcomes.[27,28] Conversely, unsuccessful patients without prior exposure engaged in less efficient trial-and-error self-management processes that often led to confusion and uncertainty, rendering them less able to effectively manage their condition. Observational learning is far more efficient than operant learning for acquiring complex behaviors, such as the self-management of diabetes.[29] For individuals without the benefit of modeling by family members, opportunities for observational learning can be made available through group interventions. Diabetes education groups and group visits that

foster observational learning have been shown to be effective for improving intermediate outcomes and long-term self-management practices.[30, 31]

In addition, family members and friends were important ongoing sources of support for successful patients but less so for unsuccessful patients. These findings are consistent with studies that demonstrate the importance of social networks for patients with diabetes, particularly for those in underserved communities.[32,33] It may be useful for clinicians to assess social support at the time of diagnosis. This can be achieved using a tool such as the Social Network Map[34] that prompts patients to describe and discuss the quality and scope of their social support system.

Key turning point events appeared to play an important role in motivating patients to effectively gain control of diabetes. Successful patients who initially denied the severity of their disease often reported reaching a critical turning point at which they experienced increased awareness and made a radical shift in both their perception of the disease and self-management behavior. Other investigators have reported similar findings, in which events triggered individuals to self-reflect and re-assess the severity and seriousness of their health condition, ultimately motivating them to greater levels of self care.[35,36] Empirical evidence suggests that turning points occur when distressing accumulated evidence about one's health leads to internal conflict with longstanding values or goals.[37] Individuals engage in critical self-appraisal followed by small behavior change action steps. It has been posited that changes are sustained if the individual's personal identity is revised to incorporate modified health beliefs.[37]

In the present study, successful patients' processes of change appear to be consistent with the principles of two theoretical health behavior models, the Health Belief Model[38] and the Transtheoretical Model.[39] Distressing diabetes-related events may have prompted patients to critically re-evaluate their perceptions of disease severity and the corresponding health risks, in accordance with the Health Belief Model. Health risks were interpreted in light of personal goals and values, leading to movement through the stages of change, in keeping with the Transtheoretical Model. It is important to note that successful patients did not report sentinel health events more frequently than unsuccessful patients, but successful patients were more likely to interpret these events as signs that behavior change was needed. While clinicians cannot induce turning points, they can assess intermediate disease outcomes to create leverage for change. Patients who do not interpret distressing health events as turning points may benefit from motivational interviewing techniques that aim to minimize resistance, explore ambivalence, and highlight discrepancies between health behaviors and the patient's values and life goals to facilitate movement through the stages of change.[40]

Findings from the study should be interpreted in light of its limitations. Most significantly, members of the successful and unsuccessful groups appeared to differ in the severity of diabetes. Differences in length of time since diagnosis, insulin use, and clinicians' assessments of severity make it difficult to overlook the unsuccessful group's potentially greater burden of disease. However, it is not known if high diabetes severity among unsuccessful patients led to poorer control or if poorer control led to greater severity.

Similarly, it is unclear whether low severity among the successful patients led to good control or if good control kept disease progression in check.

It is important to note that unsuccessful patients averaged 3 co-morbid chronic health conditions compared to 2 co-morbidities for successful patients. Each chronic condition potentially complicated diabetes management, burdened the patient psychologically and financially, and may have contributed to reducing motivation for self-management.[40,41] The most common co-morbidity for unsuccessful patients was depression, which has been associated with poor glycemic control[42] and non-adherence.[43] Depressed diabetes patients have been shown to be less likely to adhere to dietary recommendations and oral diabetes medications, and less often engage in regular physical activity compared to non-depressed diabetes patients.[44, 45]

A strong association has been demonstrated between diabetes and depression.[46, 47] Patients with high levels of depression have been shown to be almost 50% more likely to develop diabetes than non-depressed patients.[10] Conversely, diabetic patients have been shown to be twice as likely to develop depression as non-diabetic patients.[48] Because it is not known if participants in the present study were depressed before developing diabetes, it cannot be determined if co-morbid depression reduced motivation for self-management in unsuccessful patients, or if difficulties coping with the challenges of diabetes led unsuccessful patients to develop depressive symptoms. Both pathways seem likely to lead to reduced self-management behaviors and poor glycemic control.

Current clinical guidelines recommend that poorly controlled diabetes patients should be screened for depression.[49] The prevalence of depression in the unsuccessful group was very high, but nearly one in five patients in the successful group also had depression. This suggests that clinicians should consider screening for depression in all diabetes patients, beginning at diagnosis. Patients with co-morbid depression and diabetes may need pharmacotherapy and individualized self-management recommendations that take both conditions into consideration.

In conclusion, uninsured diabetes patients may benefit when clinics maximize opportunities for social learning by offering group education classes and group visits, particularly for individuals with limited social support. Routine depression screening should be considered for all diabetes patients. Finally, clinicians should be aware of opportunities to support patients' construction of turning points by using motivational enhancement techniques to help patients derive energy for change from disease-related events.

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Table 1

Characteristics of Successful and Unsuccessful Patients

	Successful (n=17)		Unsuccessful (n=9)		Total (n=26)	
	n	**%**	**n**	**%**	**n**	**%**
Most Recent HbA1c						
Mean (range)	7.3 (6–11)	-	11.0 (9–14)	-	8.6	-
Median	6.5	-	10.2	-	8.0	-
Years since Diagnosis						
Mean (range)	10.8 (0.6–35)	-	14.8 (5–30)	-	12.2	-
Median	6.0	-	14.0	-	9.5	-
Family History of Diabetes						
Yes	14	82.4	5	55.6	19	73.1
None	3	17.7	4	44.4	7	26.9
Insulin Use						
Yes	7	41.2	7	77.8	14	53.9
No	10	58.8	2	22.2	12	46.1
Participated in Group Diabetes Visits						
Yes	6	35.3	2	22.2	8	30.8
No	11	64.7	7	77.8	18	69.2
Knowledge of most recent HbA1c level						
Yes	7	41.2	4	44.4	11	42.3
No	10	58.8	5	55.6	15	57.7
Visits to Provider in the past 12 months (number)						
Mean	7.2	-	7.8	-	7.4	-
Median	7.0	-	6.0	-	6	-
Co-morbidities (number)						
Mean	2.3	-	3.1	-	2.6	-
Median	2.0		3.0		2.0	
Depression Dx						
Yes	3	18	6	67	9	35

	Successful (n=17)		Unsuccessful (n=9)		Total (n=26)	
	n	%	n	%	n	%
No	14	82	3	33	17	65
Blood Sugar Checks/day (number)						
Mean	2.0	-	2.1	-	2	-
Median	2.0	-	2.0	-	2	-
Prescribed Diabetes Medications (number)						
Mean	1.8	-	2.0	-	2	-
Median	2.2	-	2.0	-	2	-
Body Mass Index (kg/m^2)						
Mean (range)	38 (25–66)	-	32.7(22–42)	-	36.2	-
Median	34.3	-	32.5	-	33.4	-

Table 2

Clinicians' Assessment of Patients' Adherence and Control

	Successful n=13 (mean)	**Unsuccessful n=7 (mean)**
Adherence to medication regimen*	3.2	2.0
Adherence to diabetes clinic visits every 3 months*	3.2	2.6
Adherence to lifestyle recommendations*	2.0	1.3
Patient's level of control*	2.7	1.1
Severity of disease**	1.6	3.3

* Scale: 1 = Poor; 2 = Fair; 3 = Good; 4 = Excellent

** Scale: 1 = Low; 2 = Moderate; 3 = High; 4 = Very High

Table 3

Themes Associated with Successful Diabetes Self-Management

Theme	Description	Exemplar Quotations
Family Support	Successful patients commonly frequently had family members who also had diabetes; unsuccessful patients less often reported having family members with the disease	*A lot of members of my family have diabetes, so it wasn't new to me when I found out I had it. My mom and her siblings also had it, so I was educated prior to her having it because I had to administer her with insulin and her medication.* - Successful patient
Supportive Friends	Successful patients often received helpful support in managing diabetes from friends, some of whom also have diabetes; unsuccessful patients seldom cited friends as helpful in diabetes management	*My best friend is also diabetic and we've helped each other.* - Successful patient *My friend and I are on the same insulin and we talk about it. And he gives me some good recipes for things we can have.* - Successful patient
Evidence-Based Strategies	Successful patients made use of evidence-based strategies for diabetes self-management more often than unsuccessful patients	*Watch your diet, try to exercise, take care of your feet.* - Successful patient *Where I used to use butter, now I use Promise. I've taken transfats out of my diet. Instead of salt, I use Mrs. Dash. I use Splenda instead of sugar.* - Successful patient How do you know when your diabetes is under control? *When I feel normal.* - Unsuccessful patient
Information seeking	Successful patients often independently sought information about diabetes beyond what they learned from their doctor	*I went to a weight loss class; it was a tremendous help… it was really an education.* - Successful patient *I got this diabetes DVD, so I knew that my number was high and that I wanted to get it into the 6 area range* - Successful patient
Accurate Perception of Control	Successful patients tended to have a more accurate perception of disease severity and level of control than unsuccessful patients	*When the number is high, I know it's because I've done something stupid.* - Successful patient *My diabetes is very well-controlled. Very well.* - Unsuccessful patient
Turning Point	Successful patients more commonly experienced a life-changing diabetes event that motivated them to manage their condition than unsuccessful patients	*I just thought, it'll go away, you know. Then I was hospitalized and the doctor told me I could have had a stroke because my sugar was so high and I said well, this is it. I know what can happen, so I changed my lifestyle.* - Successful patient