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Integrating Undergraduate Patient Partners into Diabetes self-management education: Evaluating a free clinic pilot program for the Underserved

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Abstract

Background.—Diabetes self-management education (DSME) improves glycemic control and health outcomes in patients with diabetes.

Objective.—A process evaluation of a two-year pilot intervention examined the feasibility and acceptability of undergraduate volunteers as Patient Partners to foster DSME participation among the underserved.

Design setting, and participants.—In the setting of a student-run free clinic, 22 patients enrolled in DSME were paired with 16 undergraduate volunteers. During the DSME courses, Patient Partners assisted patients during classes, called patients weekly, and accompanied patients to clinic appointments.

Key process evaluation results.—Average attendance at DSME classes was 79.4% and 94.7% for patients and Patient Partners, respectively. Sixty-three percent of phone calls were successful and Patient Partners attended 50% of appointments with their patients. Focus groups demonstrated resounding acceptability of the Patient Partner role.

Conclusions.—Volunteer undergraduate Patient Partners are a beneficial adjunct to DSME delivery in the resource-constrained environment of a student-run free clinic.

Keywords

Diabetes self-management education; diabetes; patient education; case manager; community health worker; underserved; student-run free clinic

Type 2 diabetes is a major cause of morbidity and the seventh leading cause of death in the U.S. Approximately 25.8 million Americans (8.3% of the U.S. population) currently live with diabetes, and prevalence rates continue to rise.¹ Racial and ethnic minorities bear a

disproportionate burden of the diabetes epidemic, along with poor diabetes control and higher complication rates.^{2,3}

Effective diabetes management to achieve blood glucose control can prevent or delay disease complications.^{4,5} However, diabetes management is highly complex.⁶ Guidelines for successful disease management include regular medical appointments, blood glucose monitoring, healthy diet, exercise, and diabetes self-management education (DSME).⁷ Diabetes self-management education is necessary to maintain effective disease management.^{7,8} The impact of DSME is so significant that studies report a dosage effect of DSME attendance on laboratory markers of disease severity such as Hemoglobin A1C (HbA1C).^{9,10} Despite the positive impact of DSME attendance on disease outcomes, studies have described the average DSME program completion rate among the underserved to be as low as 29%.^{10–12}

Given the challenge of delivering DSME to minority and underserved populations, several approaches have been described, including the use of case managers or community health workers. Case manager programs use nurses and social workers to educate patients in DSME, monitor patient progress, and connect patients with services.^{9,13} Studies show that case managers facilitate patient compliance, foster DSME class attendance, and ultimately improve disease outcomes.^{3,14–18} Community health worker (CHW) interventions^{11,19–22} employ members of the target community who share characteristics with patients such as language. They provide a link between patients and diabetes health services and have been shown to increase DSME program completion rates by over 30%.^{10,21,23,24}

As diabetes care is often suboptimal among the underserved, innovative programs are not only desirable but necessary.²⁵ However, there are many financial barriers that prohibit the widespread use of case manager and CHW interventions. Notably, the essential commonality among these previous interventions is the emphasis on culturally tailored, individualized interaction. The novel DSME Patient Partner Model described in this paper captures this component by incorporating undergraduate volunteers of similar cultural background, equipped with essential diabetes management training, into a DSME program for underserved Latino patients. This unique model reduces the need for high-level training, hiring processes, and extensive budget requirements, while still achieving robust patient involvement in DSME.

Methods

Research design.

From August to November 2011 and 2012, the DSME Patient Partner pilot intervention was delivered to patients enrolled in a DSME course provided through the University of California, Irvine Outreach Clinics (UCIOC). The purpose of this pilot intervention was to determine the feasibility and acceptability of introducing undergraduate patient partners to traditional DSME delivery. Intended as a proof-of-concept study, the pilot project was launched in a single clinic setting and evaluated a select group of undergraduate volunteers taking on the new role of a patient partner and the respective patients they worked with. Though the limitations of a small sample size were anticipated, the goal of this pilot project

was to examine the extent to which these volunteers could provide a culturally sensitive, supportive relationship, while reinforcing basic diabetes knowledge.

The study was approved by the University of California, Irvine Institutional Review Board. Written, informed consent was obtained from participants in their primary language.

Study setting.

Community setting.—The intervention took place in Orange County, California, which belongs to the highest quartile in the state of California for absolute cases of diabetes.²⁶ The city of Santa Ana, with a population that is 80% Hispanic/Latino,²⁷ is a focus of widespread poverty, obesity, and high rates of diabetes.^{28,29} Also located in Orange County, is the University of California, Irvine (UC Irvine), a public institution with an undergraduate student body of approximately 22,000 students and a Liaison Committee on Medical Education (LCME)-accredited medical school.

Intervention setting.—The UCIOC is an academically affiliated, student-run free clinic serving a predominately Spanish-speaking patient population. All patients of the UCIOC are residents of Orange County who are ineligible to apply for any state or federal health aid.

Pilot intervention.

Study participants.—The 22 diabetes patients enrolled in this pilot study were between 38 and 67 years of age, eight male and 14 female. All patients spoke Spanish as their primary language. The 16 patient partner volunteers were undergraduate students at UC Irvine, 19 to 24 years of age, three male and 13 female. All volunteers were fluent in Spanish and English.

Intervention description.—A program coordinator oversaw DSME course content, facilitated class delivery, and coordinated undergraduate patient partners. The program coordinator role was fulfilled by one or two UC Irvine Health School of Medicine medical students who were all fluent in Spanish. At the inception of the intervention, a separate research committee was created to perform a comprehensive process evaluation. This research committee developed the pilot study protocol and performed the analyses of process measures. All five research members were medical students of the UC Irvine Health School of Medicine. All program coordinators and researchers were volunteers.

Patient Partner recruitment and training.—The program coordinator recruited UC Irvine undergraduate students from various UC Irvine undergraduate student organizations with a focus on Hispanic/Latino and underserved community issues, including the California Alliance for Minority Participation (CAMP), Latino Medical Student Association (LMSA), Chicanos for Community Medicine (CCM), and Minority Association of Pre-health Students (MAPS). Interested applicants attended a mandatory introductory session to assess Spanish language fluency, learn the concept of DSME, and understand responsibilities. Each completed an application verifying their age (at least 18 years old), UC Irvine enrollment status, availability to fulfill required tasks, and their motivations to be patient partners.

Structured responsibilities for patient partners included: attending all DSME class sessions, accompanying their assigned patient(s) to two diabetes follow-up appointments, and making weekly phone calls. Phone calls served as reminders for upcoming classes and provided a forum for patient partners to encourage glucose monitoring, medication compliance, and lifestyle modifications. Patient partners were encouraged to contact the program coordinator if any issues arose with their assigned responsibilities or with patient contact. Undergraduate volunteer applications were reviewed for strong personal interest in or past experience with diabetes and a commitment to perform all the required patient partner duties. The undergraduates selected possessed similar backgrounds to the intended patient population and/or had demonstrated a dedication to serve the target population as evidenced by past participation in student groups addressing Latino and underserved community issues.

In preparation for their role as DSME Patient Partners, all undergraduate volunteers attended four hours of focused training. The purpose of this training was not to train health care providers, but to equip each volunteer with the necessary tools to serve as a supporter of patient goals and a cultural and linguistic bridge to the health care system. Parts of the training included education on 1) diabetes principles, 2) the Patient Partner role, and 3) volunteer logistics, which are summarized in Table 1. Patient Partner certification was accomplished through mandatory participation in all aspects the training. Assessment of training adequacy was accomplished via feedback during focus groups, during which volunteers were asked to comment specifically on their preparedness to fulfill their role as patient partners. Any aspect of the training that was felt to be insufficient was addressed subsequently.

Diabetes patient recruitment.—Flyers were posted in the clinic to raise patient awareness of the DSME program. Patients with a documented diagnosis of type 2 diabetes and most recent HbA1C above 6.5% were identified in the electronic medical record and recruited via telephone calls by the program coordinator.

Assignment of Patient Partners to diabetes patients.—In the first year, the 13 patient participants were randomized to the 10 undergraduate patient partners, three of whom volunteered to work with two patients. One patient was removed from the class as a result of inappropriate behavior. In the second year, the six patient partners were assigned to nine diabetes patients, with three undergraduates having two patients each. In the second year, the program coordinator assigned partners based on gender and perception of “good fit,” given the aforementioned inappropriate behavior of a male patient toward a female patient partner. All data analyses were based upon intention-to-treat analysis.

DSME course.—For the diabetes education portion of the DSME course, six classes were taught over 12 weeks using curriculum from the Latino Programs of the American Diabetes Association (ADA). This curriculum is used nationally in various community groups to accomplish diabetes education for similar Spanish-speaking populations and included pre- and post-tests to assess diabetes knowledge. Classes were taught by Spanish-speaking medical students and resident physicians using the standardized ADA bilingual booklets and class outlines.^{30–33} Table 2 provides a summary of the core topics covered in the first year of the DSME course. Additional topics, such as mental health and exercise, were added to the

course in the second year based on patient requests. Each DSME class session was two hours long with one hour for interactive teaching as described above; 30 minutes for patient and patient partner interaction to review glucose logs, management goals, patient progress, and ongoing challenges; and 30 minutes for a closing raffle and announcements. In order to create an ideal disease management environment, a free glucometer, test strips, lancets, and all prescription diabetes medication(s) were provided for the duration of the 12-week course. Participants also received the American College of Physicians (ACP) magazine, *Viviendo con Diabetes*,³⁴ a cookbook following the nutrition class, and a certificate of completion at the final class.

Program funding.—The DSME Patient Partner program was initially funded by a grant of \$1,500 from the Program in Medical Education for the Latino Community (PRIME-LC). In the second year, \$3,500 was granted from the Latino Medical Student Association (LMSA) at UC Irvine.

Data collection and evaluation.

At the intervention's inception, a complete process evaluation was developed to study outcome and process measures, as well as program acceptability. Outcome measures served to measure the quality of DSME delivery and disease progression. Process measures served to assess program feasibility, with an emphasis on the program's first year. Finally, program acceptability was assessed via focus groups discussions. All data analyses and focus group discussions were conducted by members of the research committee who were not associated with the implementation of the DSME course or participant recruitment. This limited evaluator bias and ensured a safe environment to elicit qualitative feedback.

Outcome measures and quality assessment.—ADA pre- and post-tests were administered at the introductory and final class sessions. All tests were in Spanish, and bilingual volunteers were available to assist those patients with limited literacy. Furthermore, the average HbA1C value was compared before and after participation in DSME. Given that our didactic methods were previously validated by the ADA, and that our pilot study had a small sample size with a focus on process measures rather than statistically significant outcome measures, collection of outcome measures for the program at large was discontinued in the program's second year.

Process measures and program feasibility.—Relevant process measures for assessing program feasibility included attendance at DSME class, follow-up appointments, and telephone call data. At each DSME class, attendance was taken for all study participants and the average program attendance was calculated across the two years. Additionally, the undergraduate patient partners received logs to document their attendance at scheduled clinic appointments and weekly telephone calls. Due to lack of feasibility, clinic appointments were only a component of the program's first year. This is described further in the discussion section. Telephone call logs were analyzed for the number of phone calls performed, calls answered, duration of call, and topics discussed. Although all patient partners were provided and submitted call logs during both years of the study, year two call logs lacked detail

sufficient for data analysis and could not be included in the study. However, qualitative data from focus group discussions provide insight regarding phone use during both years.

Pilot program acceptability.—Focus groups were held separately for the patient and undergraduate patient partner participants. Each was led by a bilingual member of the research committee using open-ended questions via a topic guide. Focus group discussions were audio recorded and transcribed verbatim, with patient focus groups subsequently translated from Spanish into English. Transcriptions were analyzed separately by two researchers heavily familiar with the data. Standard qualitative methods with open, axial, and selective coding procedures were used. The two researchers independently coded the data to identify major themes, which were subsequently cross-checked, refined, and adjusted through discussion among the research team.

Results

Outcome measures and quality assessment.

Pre- and post-test scores.—In the first year of the pilot project, nine pre-tests were submitted. The average percent of questions answered correctly on the ADA pre-tests was 58.3% (SE: 3.2). 10 post-tests were submitted with average post-test score of 69.1% correct (SE: 3.9). This showed an average improvement of 10.8 percentage points over the duration of the DSME course in year one.

Hemoglobin A1C values.—At the start of the DSME course in the pilot program's first year, the average HbA1C among the 13 enrolled participants was 9.2%, with a range of 6.0% to 12.5%. Following the conclusion of the 12-week DSME intervention, HbA1C was collected for 10 participants. The average value among these 10 patients was 8.0%, with a range of 5.9% to 11.4%. This showed an average decrease in HbA1C of 1.2% during year one of the DSME course.

Process measures and program feasibility.

Class attendance.—During the first year of the DSME course, an average of 71.8% of patient participants (n = 13) were present at each of the six class sessions of the 12-week DSME program. Among volunteer undergraduate patient partners, the average attendance at each class was 95.0% (n = 10) (Figure 1). In the second year of the course, the average class attendance among patient participants was 87.0% (n = 9) and the average attendance for the undergraduate patient partners was 94.4% (n = 6) at each of the six DSME classes (Figure 2). Examining the data across both years, which represent two distinct patient cohorts and two separate groups of patient partners, the average class attendance rate was 79.4% and 94.7%, respectively.

Attendance at diabetes follow-up clinic appointments.—Logs of attendance at clinic appointments were submitted in the first year of the pilot study. Attendance logs showed that undergraduate volunteers accompanied their patients to 50.0% of the scheduled appointments, and patients attended 7.7% of appointments alone. Patients cancelled or were

otherwise unable to attend 19.2% of scheduled appointments. In 23.1% of scheduled appointments, attendance data was missing.

Telephone call logs.—Telephone call logs were submitted by all 10 undergraduate patient partners in the first year of the pilot study. Over the duration of the 12-week DSME program, a total of 162 phone calls were performed, with 102 answered calls (63% of all calls placed). The average number of calls to each patient was 11.6, with a range from three to 22 calls answered. The average call duration was seven minutes, ranging from 46 seconds to 40 minutes. Average call duration remained consistent throughout the 12-weeks of the DSME course, with a slight trend toward longer conversations as the course progressed (Figure 3).

Documented topics discussed during telephone conversations included: reminders to attend DSME classes and clinic appointments, reinforcement of lifestyle modifications (including diet, exercise, and glucose logs), and concerns regarding additional lancets needed or broken glucometers. As time progressed, topics extended beyond diabetes care to include issues of general well-being, family, and personal health goals.

Pilot program acceptability.

Patient focus group themes and results.—Patient focus groups evoked extensive feedback on the core components of the intervention, including the DSME course, patient partners, and telephone calls. Themes and representative quotations from patients are presented in Table 3. During the discussions, several patients expressed appreciation for the DSME course and felt that the format helped their diabetes management. With regard to the patient interactions with undergraduate patient partners, patients expressed appreciation for the volunteers' dedication to the program despite other student obligations. Furthermore, many patients felt that patient partners played a positive supportive role, educating them on their medications and motivating them to take care of their diabetes. As the course progressed, patient partners increasingly served the role of a supportive family member rather than that of a health care worker. Patients voiced general acceptance of the weekly telephone calls and did not view them as intrusive. Rather, the phone calls were an opportunity for additional reinforcement of diabetes self-care and a reminder that there was another individual who cared about their progress and overall health.

Undergraduate Patient Partner focus group themes and results.—Focus group discussions among undergraduate volunteers addressed the dynamics of patient interactions, telephone calls, and personal experiences in the patient partner role. Themes and representative quotations are presented in Table 4. As the course progressed, several patient partners perceived that their involvement in their patients' lives was appreciated and welcomed. Many patient partners conveyed satisfaction with the contributions they made to their patients' diabetes management by providing support, a listening ear, individualized attention, and assistance with understanding medications and other common questions. Additionally, weekly telephone calls seemed well received by patients. They offered an opportunity to reinforce diabetes education and to develop a more comfortable and personal connection with patients. Finally, concerning the patient partner experience, several

participants expressed personal gain and growth from their involvement by applying the knowledge to their own lives and gaining exposure to the important role of patient education.

Discussion

Discussion of results.

Diabetes self-management education has undergone a shift in recent years from traditional didactic formats to more interactive, empowerment-centered approaches.^{7,35} The latest methods highlight the impact of culturally tailored, individualized support on diabetes knowledge, behaviors, and disease outcomes among Hispanic/Latino diabetics.⁹ The DSME Patient Partner model draws upon more elaborate, costly models to create a feasible and acceptable intervention strategy in the resource-constrained setting of a student-run free clinic. Given the historically low DSME program attendance among the underserved, this program's average attendance of 79.4% sustained across two years is particularly noteworthy. Consistent with previous studies, the incorporation of personalized attention through one-on-one interaction exerted a positive impact on DSME.^{9-11,17,18,22} The advantage of our model being the lower cost burden, while yet achieving superior class attendance. In this intervention, undergraduates provided personalized attention, motivation, and accountability for patients, thereby bolstering the diabetes education presented in DSME classes. The overall satisfaction with the DSME program expressed during focus groups support the acceptability of the intervention for this underserved, Latino patient population.

The process evaluation data scrutinizes the interaction between patients and their undergraduate partners. Analysis of weekly phone calls and follow-up appointments showed that telephone calls were more feasible. Patient partners reported attending only 50% of scheduled visits with their patients. Various factors related to last minute cancellations or schedule changes often precluded patient partners from accompanying their patients. Secondary to logistical difficulties, this component of the patient partner role was removed during the program's second year.

In contrast, weekly phone communication was a more consistent avenue for interaction outside of DSME class time. The feasibility and acceptability of phone calls described during focus groups demonstrated that despite serving an underserved patient population with potentially limited access to phones and minutes, phone communication was not hindered. Rather, the weekly calls served as a desirable way for patients to remain connected to their diabetes care outside traditional class and appointment times.

Despite the benefits of the phone conversations, feedback revealed additional interaction beyond weekly phone calls, which elucidated the need for boundaries to protect undergraduate volunteers. Volunteers were not expected to receive calls from patients, nor give their personal phone numbers to patients, though several chose to do so. These guidelines also applied to in-person contact, which was only expected to take place on clinic grounds in the context of diabetes classes or appointments. Patient partners took the opportunity to seek guidance from the program coordinator with questions or issues regarding patient contact. This open environment enabled timely identification of any issues and led in one case to the immediate removal of a patient from the class. With the

aforementioned provisions in place, the second year of the intervention did not herald further issues. Thus, other clinics wishing to implement this model should set clear boundaries to protect volunteers.

Health care for the underserved is frequently delivered through safety-net organizations such as student-run free clinics affiliated with an academic institution. University settings have access to undergraduate and medical student volunteers, many of whom share the cultural backgrounds of surrounding patient populations. In this pilot intervention, the UCIOC successfully recruited highly motivated, culturally congruent undergraduate volunteers who fulfilled a valuable role as one-to-one partners for patients struggling with diabetes. These young volunteers, in turn, gained awareness of disease processes affecting their community and potentially their own families. In fact, many went on to pursue graduate education in public health, nursing, and medicine, and reflected that their experience as a patient partner contributed to their decision.

The DSME Patient Partner model has the potential to fill a substantial gap in patient education programs for the underserved by providing a model for individualized support through highly motivated undergraduate students. Such collaboration has extensive applicability to a variety of underserved and minority patient populations that often have limited psychosocial support to achieve better health. Furthermore, by serving as an adaptable template, this model can be applied beyond the realm of DSME and tailored to other chronic diseases and cancers, which also require diligent long-term self-management and individualized support outside of a clinic setting.

Study limitations and future directions.—As a proof-of-concept study assessing a pilot intervention, this evaluation was limited by both small sample size and a single clinic setting, which serves a predominantly Latino patient population. Further research is necessary to assess the feasibility of a larger program employing a similar model to other underserved populations and cultural groups. As expected, due to the small sample size, the pilot program was limited in its ability to assess the effectiveness through statistically significant decreases in modifiable disease measures such as HbA1C. Nevertheless, data from the first year do suggest a promising trend towards decreased HbA1C and increased diabetes knowledge. Given that previous studies have shown a dosage effect of DSME class attendance on HbA1C,^{9,10} the high attendance rates of the Patient Partner model holds great promise for measurable effectiveness with a larger sample size. Furthermore, future studies should also aim to follow patients over a longitudinal time course to evaluate for sustained benefits in disease management.

This evaluation is also limited in its ability to elucidate causation as the connection between the Patient Partner model and the demonstrated class attendance. While it is possible that other incentives may have affected class participation, the personal contributions of the patient partners remains the most prominent aspect of the intervention. Future research should consider employing the Patient Partner model while controlling for program-provided resources to better understand how this model promotes higher course participation.

Conclusions.—The foremost purpose of this study was to show proof-of-concept for the introduction of undergraduate patient partners to augment standard ADA-based DSME. Through this model, we observed that basically trained, culturally congruent, undergraduate volunteers serving as one-to-one patient partners were a valuable resource to our diabetes patients during their participation in DSME. Rather than fulfilling a specific medical need, patient partners met a considerable social need among the patients as personal motivators, supporters, and friends. The Patient Partner model differs from previously published interventions employing trained nurse case managers or community health workers, both of which can be financially impossible in a resource-constrained health care setting.

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Figure 1.

Year one patient and undergraduate patient partner DSME class attendance at the six DSME classes sessions held over the 12-week DSME program (August 2011-November 2011).

Figure 2.

Year two patient and undergraduate patient partner DSME class attendance at the six DSME classes sessions held over the 12-week DSME program (August 2012-November 2012).

Figure 3.

Average call duration of answered weekly telephone calls between undergraduate patient partners and their assigned patient during year one of the DSME course (August 2011-November 2011).

Table 1.**SUMMARY OF THE PATIENT PARTNER TRAINING PROGRAM**

	Training Topic	Instructor	Format / Content
Diabetes Principles	Overview of diabetes	Year 1: UCIOC patient educator	Year 1: <ul style="list-style-type: none"> • Didactic lecture • Handout ('Sugar metabolism')^a
		Year 2: DSME program coordinator	Year 2: <ul style="list-style-type: none"> • PowerPoint presentation • Handouts ('Diabetes & Diabetes Management' and 'Insulin is the Key that Unlocks the Door to the Cell') • Q&A session
	How to use a glucometer	Year 1 & 2: DSME program coordinator	Year 1 & 2: <ul style="list-style-type: none"> • Hands-on practice • Handout ('How to use the Target Up & Up glucometer') • Q&A session
	Motivational interviewing	Year 1 & 2: medical student with public health masters degree	Year 1 & 2: <ul style="list-style-type: none"> • Power point presentation (An Introduction to Motivational Interviewing Techniques for Patient Educators') from approved medical school curriculum
Patient Partner Role	Principles of diabetes care	Year 1 & 2: clinical professor from the Department of Family Medicine	Year 1 & 2: <ul style="list-style-type: none"> • Oral presentation on the common problems and concerns of diabetic patients • Clinical vignettes with advice and guidance for what to expect when working with patients with diabetes • Q&A session
Volunteer Logistics	Health Insurance Portability and Accountability Act (HIPAA)	Year 1 & 2: UC Irvine Office of Research	Year 1 & 2: <ul style="list-style-type: none"> • Online tutorial designed for UC Irvine faculty, staff, and students
	Volunteer safety	Year 2: DSME program coordinator	Year 2: <ul style="list-style-type: none"> • Oral presentation on the boundaries and limitations of patient interactions^b

^aCopies of all training handouts listed can be obtained from authors upon request.

^bPlease see discussion section for further details.

Table 2.**SUMMARY OF DSME COURSE CONTENT**

DSME Class Session	DSME Course Topic	Instructor	Format/Source
Class #1: Introduction	DSME course overview How to use a glucometer	DSME program coordinator Undergraduate patient partners	<ul style="list-style-type: none"> • Poster/visual aid • Q&A session • ACP magazine³⁴ • One-on-one instruction with hands-on practice
Class #2: <i>En Contacto</i> (Stay in Touch)	Neuropathy	Medical student	<ul style="list-style-type: none"> • Poster/visual aid • Interactive activity • Q&A session • ADA booklet³³
Class #3: <i>Con Los Ojos Abiertos</i> (With Open Eyes)	Retinopathy	Family medicine resident physician	<ul style="list-style-type: none"> • Poster/visual aid • Interactive activity • Q&A session • ADA booklet³¹
Class #4: <i>De Todo Corazon</i> (With All My Heart)	Heart Disease	Medical student	<ul style="list-style-type: none"> • Poster/visual aid • Interactive activity • Q&A session • ADA booklet³⁰
Class #5: <i>Salud y Sabor en la Cocina Latina</i> (Health and Flavor in the Latino Kitchen)	Nutrition	Medical student	<ul style="list-style-type: none"> • Poster/visual aid • Handout (Preparation and consumption of a healthy lunch) • ADA booklet³²
Class #6: Grocery Store Tour and Graduation Ceremony	Healthy food purchases in the grocery store	Medical student	<ul style="list-style-type: none"> • Oral instruction on appropriate portion size, reading nutrition labels, avoiding foods with high sugar and fat content • Champions for Change website³⁶

Table 3.

YEAR ONE AND YEAR TWO REPRESENTATIVE FOCUS GROUP QUOTATIONS FROM PATIENT PARTICIPANTS CONCERNING THE PILOT INTERVENTION

Themes	Quotations
DSME course:	
Appreciation	<ul style="list-style-type: none"> I want to give thanks because its the first time that I am in a group like this, and personally it helps me with the diabetes. The truth is when they told me about this class for the first time, it bore me, but I left here very different.
Patient Partners:	
Appreciation	<ul style="list-style-type: none"> Yes, it was good [having a patient partner], To think that they took so many classes and so many studies, with their school and everything. I also give thanks to all of you in this group who took interest in us. Especially [my patient partner], as she was the one that called my house two, three times a week or when we did not come to class she would also call. And she ... gave me a lot of enthusiasm to continue the instructions on how to take care of the diabetes and I am very happy with [my patient partner] and may God bless her and everyone that worried about us.
Supportive	<ul style="list-style-type: none"> [Having a patient partner] was a support, very much. I love them a lot... such good people like this, just like they supported us, we support people who have this disease. A [patient partner] explains how to take the pills, because sometimes he [the patient] takes them and sometimes doesn't know that they're working, and sometimes he [the patient partner] would explain that "this works for this". Well I feel like I don't have much support, the only support like I mentioned before is the support from the girl [my patient partner] that would call me, but no one else. To know that a person that is not of the family is asking "Oh how are you feeling? What are you doing?" It is beautiful. It is beautiful.
Motivational	<ul style="list-style-type: none"> She [my patient partner] was an excellent girl. She was always devoted to me. Also she would motivate us to take our medications as prescribed. For me it [having a patient partner] was very good, because it motivated me, it motivated me a lot. Well we can't become unmotivated because we have to remember that if the students were doing this with such pleasure and everything, we have to continue to move forward and not be unmotivated. We have to motivate ourselves more.
Individualized	<ul style="list-style-type: none"> It's good because ... it's important to assign someone to every person. I just want mine [own patient partner], She doesn't want to share [her patient partner].
Telephone Calls:	
Acceptable/Non-intrusive	<ul style="list-style-type: none"> She [my patient partner] talked to me two times in a week. She asked me, "How is your sugar? How are the numbers of sugar?" And now I have it good. The guy was very good, and now we are worried because he didn't call last night.

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Table 4

YEAR ONE AND YEAR TWO REPRESENTATIVE FOCUS GROUP QUOTATIONS FROM UNDERGRADUATE PATIENT PARTNERS CONCERNING THE PILOT INTERVENTION

Themes	Quotations
Patient Interactions	
Acceptable	<ul style="list-style-type: none"> I was so excited to meet my patient and interact with them ... the first time it was really awkward, but then slowly as we talked more and he [my patient] saw that I was generally interested in like helping him and learning more about his particular diabetes, it flowed better, so I had a good experience. Her [the patients] relationship with her family was really strained ... so when I showed her I was interested in helping her, she was really welcoming to that. She loved the attention. She appreciated receiving the attention from us because she didn't get it [at home]. She would tell me about how she was depressed, but that around me [the patient partner], she would also get happy and that she knew there were other people that cared besides her family ... she appreciated the fact that there were people out there that really wanted to help ... she would talk to me for hours. I felt like after the first two [classes] they [my patients] were asking more questions and more things came up and they felt more comfortable asking me about them. I feel that it was really beneficial for them to have somebody ... always there to listen to them ... It was really something special for them to have a friend that would always be just a phone call away. I feel like she [the patient] felt like she was important in some way because she received attention from us that she didn't receive at home ... I feel that contributed to her being more proactive about her diabetes. I think we accomplished a lot because she [my patient] didn't know when to take her medications so she was guessing ... which is dangerous. So afterwards, I marked it down on her meds when to take it and she felt that it was good.
Personal Connection	<ul style="list-style-type: none"> There was this connection between me and her [my patient] ... I think that it's a big thing for them to open up. There has to be at least a bond, like a connection between you two so that they can open up, and at least they know that you care. I felt like she would just talk to me, like she just wanted to talk, and it wasn't about diabetes, it was about her family, and about how her grandkids were doing, and I felt like she trusted me a lot. Everything [in our relationship] was like friend and family terms because he [my patient] would ask me questions and I would ask him questions, so it was like in equilibrium. I think the human interaction helped us establish a connection with the patients and build some sort of foundation so that they could trust that they could share stuff about their life with us.
Supportive	<ul style="list-style-type: none"> I think it helped just by me listening. And all I could do was listen, I didn't know what to say or anything. I think it made a difference, the fact that they knew we ourselves had relatives going through the same struggle ... it let them [the patients] open up a little bit more and like trust us a little bit more too. I think for me, for my patients, the human interaction made it feel like someone cared. Because it's not often that they get the type of support that the patient partners give in this project. It's more like we're asking questions not just to ask them, we're asking them because we actually care, since you know, we are volunteers and we're volunteering our own time. So I think having someone who supports you is really important for them. Because sometimes their family doesn't understand or they don't know what to do about it or how to change it, so to have somebody there is sometimes something new or something that they always wanted.

Themes	Quotations
Telephone Calls	
Acceptable	<ul style="list-style-type: none">• In the beginning, I would ask her questions ... but then as we went to more classes, I felt that she understood more, so she had the knowledge to be able to ask me questions [over the phone].• We would always talk about food and walking and exercise.• Especially through the weekly phone calls, me and my patient got more comfortable talking to each other, and I knew more of her habits and what was going on in her life.• She really appreciated that we called her just to check up on her and see how she was doing and she really liked it that there was somebody calling her just to talk about her issues with her health, she really appreciated it.
Personal Connection	<ul style="list-style-type: none">• First thing [I would ask], "How was your diabetes?" "How was your glucose?" And then there would be one and a half more conversations towards the end [of the phone call] that were separate from what your mission was to do in the first place ... then I start talking about his family and [controlling diabetes] for your family.• [Diabetes] is the first thing we talk about [on the phone], and after we get that out of the way, she likes to talk.• I felt like at the doctors appointment, we had a lot of time waiting outside, talking about our families and so after that when we were on the phone, I felt like she would just talk to me, like she just wanted to talk, and it wasn't about diabetes, it was about her family, and about how her grandkids were doing, and I felt like she trust me a lot more."
Patient Partner Experience	
Positive	<ul style="list-style-type: none">• I would definitely recommend the program for patients and people who want to be patient partners, too, because it's a very hard eye opener. You don't really know what these people are going through until you meet them. There are so many other things underneath just being sick.
Personal gains	<ul style="list-style-type: none">• I applied it [the lessons from the class] to at least my own life [and my own family].• During the program and after the program, I went right away to my parents [to ask if they had gotten their glucose checked?] So I started helping my family. That's what I gained from this.• I saw a different approach to medicine I really liked; it's more of an educational and support-type thing, and it got me thinking of different paths and what I want to pursue.