Telephone Coaching to Improve Diabetes Self-Management for Rural Residents

Linda Garrelts MacLean, BPharm, John R. White, Jr., PharmD, Shirley Broughton, MPH, RD, CD, Jennifer Robinson, PharmD, Jill Armstrong Shultz, PhD, Douglas L. Weeks, PhD, and Megan N. Willson, PharmD

Low-cost methods are desperately needed for improving diabetes management for people with diabetes in rural communities. With this understanding, the research team designed a project that used student pharmacists as coaches.

High rates of diabetes and its complications in many rural communities point to these sites as diabetes hot spots.[1] In Washington State's diabetes hot-spot communities, 17% of people > 45 years of age have diabetes on average, compared to 8.6% of people ≥ 45 years of age statewide. In one remote rural community, 40% of the population has diabetes. People in diabetes hot-spot communities also have higher rates of hospitalizations for severe diabetes complications.

Controlling diabetes to reduce the incidence of its complications rests largely on individual patients and requires vigorous self-management of the disease.[2] Unfortunately, without sustained support, few people achieve their goals or master the tasks that will allow them to live healthfully and reduce their risk of costly complications.[3]

Telephone follow-up for education and support has been shown to be a cost-effective method for improving healthy lifestyle behaviors in a variety of conditions, including diabetes.[4–7] This project tested the use of brief telephone coaching sessions to improve the health of rural residents with diabetes by helping them achieve diabetes self-management goals for regular medical care and adherence to medication, diet, and physical activity regimens. Specifically, the research intent was to determine whether:

1. Participants would be better able to implement self-management tasks and reduce their risk of diabetes complications compared to a historical control group not receiving coaching,
2. Faculty and staff at the Washington State University (WSU) Extension and College of Pharmacy would be able to develop a telephone-coaching program to support additional lifestyle modifications after diabetes education to augment health care in rural areas, and
3. Telephone coaches would be able to successfully provide support for people with diabetes.

Methods

Through a partnership forged between the WSU College of Pharmacy and WSU Extension, this project provided a bridge between rural diabetes hot-spot areas and health care support via student pharmacist telephone coaches. On a yearly basis, WSU Extension faculty members conduct a community diabetes education program titled On the Road to Living Well with Diabetes (OTR). OTR, developed by the Joslin Diabetes Center in collaboration with Extension in five states (Washington, Hawaii, New Mexico, West Virginia, and Pennsylvania), has been extensively evaluated.[8] Created to augment OTR, an 8-week telephone-coaching program paired student pharmacists functioning as telephone coaches, with individuals who had just completed an OTR 6-week program. During weekly phone calls, the telephone coaches used motivational interviewing (MI) techniques to support lifestyle modifications for successful management of daily diabetes routines such as implementing appropriate self-care strategies, monitoring blood glucose, taking prescribed medications, and following diet and exercise regimens, as well as getting regular medical care.

Design

The target population was recruited from OTR classes conducted in three rural Washington counties. Fifty individuals were successfully enrolled. This group was compared to an historical control group of 66 OTR participants from the previous year who had not received telephone coaching but who were also assessed pre-program and 8 weeks after completion of OTR.

Telephone coaches were second professional year Doctor of Pharmacy students who had successfully completed *1*) a course in health communication and *2*) additional training about diabetes, diabetes self-management, MI, and problem-solving. Coaches were selected for maturity, conscientiousness, academic standing, expressed interest in the project, and willing-

ness to devote time to the project because the time commitment would be ~ 4 hours per week.

The title of "coach" was intentionally chosen to convey that the calls were intended to facilitate program participants' goals rather than to manage their diabetes or to prescribe treatment. The job description for the telephone coaches was based on the definition of mentor; that is, the coaches functioned as advisers, guides, teachers, supporters, resources, and confidants.

Using OTR as a guideline, the telephone coaches were trained to use MI and a problem-solving approach to engage participants in conversation about barriers to achieving their goals and to help identify solutions or help modify their goals (smaller steps) and eventually implement strategies to successfully manage diabetes. The coaches encouraged participants to seek regular care from a health care provider to reduce the risk of complications.

Additionally, the coaches emphasized self-management behaviors that are most likely to reduce the risk of diabetes complications. These health behaviors and lifestyle modifications, also emphasized in OTR classes, include: *1*) seeking regular medical care and requesting that the medical provider monitor diabetes management (i.e., A1C testing, blood pressure and blood lipid evaluation, microalbuminuria testing, and retinal exams), *2*) performing regular self-monitoring of blood glucose, *3*) adhering to medication schedules, *4*) making healthy food choices, and *5*) getting the recommended amounts of daily physical activity as a part of a routine for healthy living.

Guidelines for the telephone encounters were developed for the student pharmacists by all faculty members involved in the project, following a format developed by Sacco et al.[9] Calls were semi-structured and lasted ~ 10–20 minutes. Beginning with an inquiry about program participants' goals (developed during the OTR sessions) or other items that program participants would like to discuss during the telephone session (agenda-setting), the coaches encouraged conversation about general care areas: adherence to medication, diet, physical activity routines, and the past week's achievements and barriers.

The remainder of the call focused on goal-attainment and goal-setting for each area of diabetes self-care that was of concern, guiding participants to state goals, including intentions for when, where, and how the goals would be achieved. Initially, coaches encouraged limited, highly attainable goals with the expectation of gradually increasing the level, complexity, and number of goals.

Coaches were trained to reinforce positive change and encourage and support further change. When program participants had difficulty achieving intentions, coaches gently queried them about obstacles and possible solutions for goal attainment. Coaches were trained to not give medical advice and were well equipped with checklists and guidance to effectively conduct their calls. These materials are available from the program on request via e-mail to the corresponding author at lmaclean@wsu.edu.

After the initial training, the coaches and faculty settled into a weekly routine for preparation and debriefing during the 8-week program. Coaches, three School of Pharmacy faculty members, and one Extension faculty member (a registered dietitian) met for an hour in the morning. This time was devoted to debriefing from the calls placed the week before and preparing for the calls that would occur that afternoon.

During the debriefing, discussion centered on any problems encountered during coaching sessions, identifying suggestions for addressing problems, and providing positive feedback. All faculty members assisted students in developing effective communication encounters with the participants. The Extension faculty provided information on local resources, helped the coaches understand the communities in which they were working, and educated the coaches about how to discuss nutrition effectively.

Evaluation and Assessment

A standardized questionnaire that has been used by OTR for ~ 10 years was used to collect information at enrollment before any OTR instruction (pre-test) and at follow-up (post-test). Information collected included demographic characteristics (age, education, income, and location within the state); years since diagnosis of diabetes; adherence to recommendations for diet, exercise, and medication; attitudes about diabetes; feelings of confidence in ability to manage diabetes; and presence of depressive symptoms. Additionally, A1C and systolic and diastolic blood pressure were measured at enrollment and follow-up.

Results from the OTR telephone-coaching program and clinical data were compared to data from participants in the previous year's program (historical control subjects) to determine whether there were differences between those who participated in OTR in the past and those who participated in the OTR telephone coaching program.

Participants in the coaching program answered an additional five multiple-item questions that

assessed their attitudes toward the coaching process and their coaches, including the effectiveness and perceived value of their coach and the coaching experience. Goal-setting during the telephone coaching segment, as distinct from goal-setting within the OTR session, was also assessed.

Results

Fifty participants completed the coaching intervention and were measured at the follow-up visit. Thirty-five participants had a pre-course A1C of < 7.0%, whereas 15 participants had an A1C ≥ 7.0%. In the historical control group (n = 66), 39 clients had an A1C < 7.0%, whereas 27 had an A1C ≥ 7.0%. Pre-course mean A1C levels for the control and coaching subgroups having an A1C < 7.0% were the same, at 6.1%. However, pre-course mean A1C levels for the control and coaching subgroups having an A1C ≥ 7.0% were 8.1 and 9.8%, respectively.

The pre- to post-test change in A1C was negligible in both subgroups having an A1C of < 7.0% (mean change in A1C –0.15% for control group and –0.09% for coaching group). For the subgroups of those with pre-course A1C levels ≥ 7.0%, the pre- to post-test change in A1C was 0.5% for control subjects and 1.3% for coaching subjects.

Systolic and diastolic blood pressure levels were not different between the historic control and coaching groups pre- or post-course.

Coaching group participant responses to coaching assistance questions revealed broad agreement (79.2%) among participants that their coach helped them figure out what to do to better control diabetes, that their coach's encouragement was important in controlling diabetes (72.9%), that coaching was an important part of the overall program (83.4%), and that coaching enhanced the OTR classes (68.8%). Finally, 50.1% of coaching group participants expressed interest in receiving further coaching to help support their diabetes control.

Discussion

This research began with the expectation that telephone coaching by student pharmacists as an extension of the OTR diabetes program would have a positive impact on the biomarkers tracked and would be an effective supportive intervention for participants. As noted above, a positive impact on systolic and diastolic blood pressure levels was not observed. However, A1C levels, although not dramatically improved, do warrant further discussion. In addition, the responses from participants and feedback from coaches during debriefing sessions indicated that this program was valued and could serve as a reproducible model for other settings.

A1C levels of OTR attendees have declined through the years. A1C levels of the majority of both historical control and coaching subjects were just under 7%. This, coupled with the fact that there was a large difference in mean A1C between the control and coaching subgroups having an A1C ≥ 7.0%, encouraged the investigators to continue to research the influence of this telephone coaching program using a concurrent control arm.

Initial evidence supports the positive impact of OTR classes, with additional potential positive impact from coaching. From a pre-course A1C mean value of 8.7%, historic control subjects had a mean follow-up A1C of 8.0% 3 months after OTR; this follow-up value for coaching subjects was 7.7%.

Although the timeframe to demonstrate A1C impact (change in A1C over 3 months) was adequate in the case of the OTR, the timeframe used for A1C testing that occurred immediately after the coaching program was not sufficient to estimate the total effect of coaching on A1C. The true impact of the coaching program needs to be measured.

Furthermore, the researchers contend that the demonstrated positive impacts of telephone coaching on attitude and behavior represent a pathway to clinical impact that requires time beyond the end of coaching to manifest. This gap in impact will be addressed in the proposed second-phase study by measuring A1C a third time at 6 months after OTR, which is 3 months after coaching.

Participants and student pharmacists clearly valued and appreciated the opportunity to be involved in the telephone coaching program. Consider the following recap from a coach about an encounter with a patient:

> *". . . last week, my participant reported she had made an appointment to see her doctor, which is a positive step—the doctor found her blood sugar was down. When I asked her what influenced the behavior that led to this result, she replied she knew her coach would be calling to talk with her, so she got on her bicycle and rode it! The patient thanked me for checking on her!"*

The debriefing sessions yielded important and unexpected information indicating that the impact of this program was rooted in the relationships that developed between participants and coaches, as noted by the following quote from a coach:

> *"Using motivational interviewing skills, including open-ended questions, helped get my participants talking. I encour-*

aged them to make goals and set a path for them to accomplish those goals. When goals were met, I congratulated them and assured them these successes were results of personal efforts. In the beginning, participants wanted to accomplish goals for me. As the weeks went on, they realized how meeting their goals were individual accomplishments with personal benefits. I really had nothing to do with these successes. I was simply, for a brief time, a needed support system."

Coaches also reported that this experience left them better equipped to communicate effectively and that they believe they will be better future practitioners because of this improved skill. One coach reported that, "while I was lucky enough to coach four participants, in reality, they were coaching and teaching me."

Based on the results from this pilot study, the investigators believe that telephone coaching positively affects diabetes outcomes through enhanced self-efficacy. Previous research has indicated a link between glycemic control and patients' diabetes self-efficacy.[10] There remain, however, several questions to be answered regarding this program:

- Is the impact something that would be sustained over time?
- How effective would this approach be in a less well-controlled population (i.e., would greater reductions in A1C be realized)?
- Would patients benefit from a permanent affiliation with a diabetes coach?

There are several appealing aspects of this approach. First, this type of program is sustainable using College of Pharmacy (or other health care) students. Second, it improves patient care while also providing a teaching environment for students. Third, it is transferable to virtually any state with a university that has Extension programs dealing with diabetes and a cadre of health care students. And finally, it provides a diabetes-centered social affiliation and support structure that is not always available to individuals living in rural, or even in urban, areas.

Conclusion

Student pharmacist telephone coaching is an effective, low-cost method to improve self-management of diabetes among rural residents with diabetes. The demonstrated positive impacts of telephone coaching on participant attitude and behavior may represent a pathway to clinical impact that requires time beyond the end of coaching to manifest.

Further investigation is needed to determine what this clinical impact might be, including expanded timelines for post-testing, coaching by students in other health care disciplines, and specific testing of coaching elements that support high-impact patient self-care such as medication-taking and attention to diet.

However, the tools, timeline, and program developed for this project are scalable and can be implemented as innovative partnerships in other communities.

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Linda Garrelts MacLean, BPharm, is associate dean for professional education and outreach and a clinical associate professor; John R. White, Jr., PharmD, is a professor and interim chair of pharmacotherapy; Jennifer Robinson, PharmD, is a clinical assistant professor; Douglas L. Weeks, PhD, is a clinical professor; and Megan N. Willson, PharmD, is a clinical assistant professor at the Washington State University (WSU) College of Pharmacy in Spokane. Dr. White is also a deputy editor of Clinical Diabetes. *Shirley Broughton, MPH, RD, CD, is Extension coordinator for diabetes education at the WSU—Puyallup Research and Extension Center. Jill Armstrong Shultz, PhD, is a professor of nutrition and exercise physiology at WSU College of Pharmacy in Pullman.*