Redesigning the Traditional Community Health Screening Model to Provide Blood Glucose Screening and Interdisciplinary Health Education

Kimberly C. McKeirnan, Shannon G. Panther, and Julie M. Akers

Community health screenings provide an opportunity for anyone to receive free or inexpensive health evaluations to help determine their risk of developing a medical condition such as diabetes. A major disadvantage to traditional health screenings is that they provide one-time data for participants but lack continuity of care. The participants are required to independently use the results from their screening to follow up with another provider.

Early detection and screenings can improve patient health outcomes and reduce the costs of care. The Diabetes Prevention Program conducted by the National Institutes of Health and the U.S. Department of Health and Human Services showed that people at risk for developing diabetes could prevent or delay the onset of the disease through early detection, lifestyle modification, and medication therapy, when appropriate (1). An economic analysis by Chatterjee et al. (2) found that early detection of diabetes through health screenings provides overall health care cost savings.

With these considerations in mind, the goal of this project was to redesign the community health screening model to provide regularly scheduled health screening opportunities, patient education, and early detection and to improve access to care.

Design and Methods

Recognizing the need to expand clinical screening services provided in a community setting, the College of Pharmacy at Washington State University (WSU) decided to redesign the traditional health screenings model to improve patient outcomes by providing multiple scheduled follow-up visits and to improve access by offering onsite health screenings at participants' workplaces. A partnership developed between the College of Pharmacy and the staff of local schools to increase early recognition and provide screening for costly disease states. The Institute for Healthcare Improvement Triple Aim Initiative (3) was considered in selecting specific screenings that could reduce overall costs of care through early detection, improve the health of the population, and improve patients' experience by bringing screenings to convenient (worksite) locations. In addition to screenings, these events provided disease state education and recommendations for follow-up based on individuals' screening results. Screenings offered included blood glucose, blood pressure, bone fracture risk, dental/oral health, BMI, body fat percentage, and grip strength.

Initially, the onsite community health screenings were organized and operated by pharmacy students. To increase interprofessional, team-based student learning and patient accessibility to multiple health care disciplines in the same site, the WSU College of Pharmacy invited students and faculty from the WSU Nursing and Nutrition Exercise Physiology programs, Eastern Washington University Physical Therapy, Occu-

WSU College of Pharmacy, Spokane, WA

Corresponding author: Kimberly C. McKeirnan, Kimberly.McKeirnan@wsu.edu

FIGURE 1. Sample screening results report.

pational Therapy, Dental Hygiene, and Speech and Hearing Sciences, and the University of Washington Medical School WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) programs to participate. These interprofessional and intercollegiate screenings also provided the opportunity for students to practice team-based problem-solving, refine their patient care skills, and learn about the similarities and differences among the disciplines' scopes of practice.

Once the screenings were completed, the health care students provided recommendations specifically tailored to each participant, with suggestions for follow-up and referrals when abnormal results were identified. The participants were also given a copy of their screening values (Figure 1). Screening value classifications were based on current treatment guidelines

TABLE 1. Blood Glucose Results of Participants Who Did Not Report Being Previously Diagnosed With a Diabetic Condition

Risk Category	Academic Year 2012–2013	Percentage of Total	Academic Year 2013–2014	Percentage of Total
Optimal	109	92.37	138	91.39
Prediabetes	8	6.78	12	7.95
Diabetes	1	0.85	1	0.66
Total	118		151	

specific to each disease state (4). In this article, only blood glucose results are reported.

Success of the health screenings was measured over time through the collection of data regarding participation rates by health care students, screening participants, number of sites, and verbal feedback from the health care student teams.

Results

In the 2012–2013 academic year, 14 community health screenings were held at seven K–12 schools. During the following academic year (2013–2014), 19 events were held at 13 K–12 schools. The number of K–12 schools involved increased by >85%, and the number of health screening events increased by >35%. Throughout the two academic years, the total number of participant health screenings performed rose from 359 to 460, an increase of >28%. Pharmacy student participation increased by >40%, Nutrition Exercise Physiology student participation increased by >250%, and four additional professional programs joined the event series.

Blood glucose screening results were reported by risk category. Optimal blood glucose was defined as <100 mg/dL when fasting and <140 mg/dL when not fasting; the prediabetes risk category was defined as 100–123 mg/dL when fasting and 140–199 mg/dL nonfasting; and the diabetes risk category was defined as a reading >126 mg/dL when fasting or >200 mg/dL nonfasting (4).

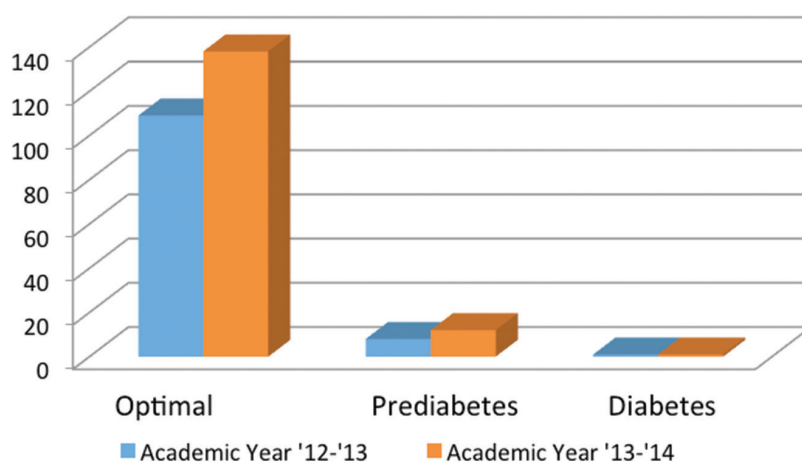During the 2012–2013 academic year, 118 participants received blood glucose screenings. Of those, 109

FIGURE 2. Number of participants per blood glucose category. Optimal: fasting <100 mg/dL, nonfasting <140 mg/dL; prediabetes: fasting 100–125 mg/dL, nonfasting 140–199 mg/dL; diabetes: fasting >126 mg/dL, nonfasting >200 mg/dL.

had an optimal value, 8 had a value within the prediabetes risk category, and 1 had a reading within the diabetes risk category (Table 1). One of the participants with an optimal value reading had self-reported being previously diagnosed as borderline diabetic. The following year (2013–2014), 151 participants received blood glucose screenings. Of those, 138 had an optimal value, 12 had a value within the prediabetes risk category, and 1 had a reading within the diabetes risk category (Table 1 and Figure 2). Four of the community health screening participants during this year self-reported being previously diagnosed with a diabetic condition. Of these, two had a value in the optimal risk category, one had a value in the prediabetes risk category, and one chose not to receive a blood glucose screening.

Discussion and Conclusion

The number of sites and requested screening events increased year over year. This reflected school district interest in providing easily accessible screening events to improve employee health. More schools made requests than could be scheduled in the 2013–2014 academic year. Through this experience, it was determined that both students and participants were excited about the interprofessional health screenings, as evidenced by increased participation rates in both groups. The overwhelming interest shown by prospective sites was beyond the program's capacity to serve. Going forward, the program hopes to expand to meet the needs of the additional worksites.

The rate of optimal blood glucose screenings showed slight improvement, the number of prediabetes results increased slightly, and the

number of screenings in the diabetes range remained the same. Screening identified 2 individuals with undiagnosed diabetes and 20 with prediabetes. The number of participants who chose to take part in the blood glucose screening increased by 28%. We believe this could lead to decreased health care costs and improved patient outcomes through early intervention, provided participants use their screening results to follow up with their primary care provider or consider lifestyle changes when appropriate.

Student feedback gained through group discussion indicated that students were previously unaware of the overlap in scopes of practice among the various disciplines involved. The screening events also enlightened students regarding the importance of collaboration as part of a health care team.

Many questions resulted from this project that could be the basis for future study. Items of interest to the researchers include the number of participants who use health screenings as a sole source of care or who made lifestyle modifications in place of seeking medical treatment; the number of participants who followed up with a primary care provider as a result of the screenings; the number of participants who received a diagnosis of prediabetes or diabetes; and the number of participants who began medication therapy after being screened.

Duality of Interest

No potential conflicts of interest relevant to this article were reported.

References

1. U.S. Department of Health and Human Services, National Institutes of Health. Diabetes Prevention Program (DPP). Bethesda, Md., National Institutes of Health (publication no. 09-5099), 2008, updated 2013. Available from http://www.niddk.nih.gov/about-niddk/research-areas/diabetes/diabetes-prevention-program-dpp/Documents/DPP_508.pdf. Accessed 22 January 2015

2. Chatterjee R, Narayan KM, Lipscomb J, Phillips LS. Screening adults for pre-diabetes and diabetes may be cost-saving. Diabetes Care 2010;33:1484–1490

3. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Aff 2008;27:759–769

4. Handelsman Y, Mechanick JI, Blonde L, et al. American Association of Clinical Endocrinologists medical guidelines for clinical practice for developing a diabetes mellitus comprehensive care plan. Endocr Pract 2011;17(Suppl. 2):1–53