Diabetes@Work Results Report

St. Louis Area Business Health Coalition Member Worksites Y2007

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Background

The St. Louis Area Business Health Coalition (BHC), in collaboration with the non-profit St. Louis Diabetes Coalition (SLDC), implemented a worksite-based diabetes self-management education program called Diabetes@Work at 4 BHC member worksites in 2007 – Ameren, City of St. Louis, Bryan Cave and Smurfit Stone. Diabetes@Work includes 11 one-hour weekly group sessions at the worksite, each co-led by a nurse/certified diabetes educator and registered dietitian; guest experts (physician, psychologist, pedorthist, and physical therapist) facilitate four of the sessions. Each session addresses a specific topic according to an evidence-based curriculum[1] and sets forth goals for self-management skill development (e.g., blood glucose monitoring, nutrition label reading, foot exams, etc.). Prior evaluation of this educational program has shown statistically significant improvement in self-management behaviors, diabetes knowledge and glycemic control (i.e., A1C reduction of approximately 1 percentage point from baseline to 3-month follow-up). With prior success established, the BHC-SLDC collaboration allowed Diabetes@Work to be undertaken as a *pilot program* with employers at a reduced fee (due to partial grant support via Novo Nordisk) and obtain experience and success visible to other employers in the community.

[1] The Diabetes@Work curriculum was originally developed in 2003 with a $2,500 grant from the Missouri Department of Health and Senior Services. While the curriculum has been modified over time incorporating feedback from prior implementation experiences, it has always been based on the American Diabetes Association treatment guidelines, American Association of Diabetes Educators program standards, and materials developed by the National Diabetes Education Program, National Business Group on Health, National Business Coalition on Health and America's Health Insurance Plans (www.diabetesatwork.org). Teaching materials for specific sessions include branded and non-branded resources from a number of pharma/medical device manufacturers as well as non-profit organizations and government agencies. The materials were chosen by SLDC staff based on their quality, utility and congruence with session goals.

Participating Employers

The Diabetes@Work program was first introduced to BHC member companies at a Novo Nordisk-sponsored luncheon in December 2006, the day of the BHC annual meeting. Just a modest amount of work was required after the luncheon to secure commitment of four BHC members to implement Diabetes@Work – two during the spring and two in the fall of 2007. The four companies come from different industries with different corporate cultures and varied approaches to employee health and wellness services. Ameren is the region's only electric utility company (ticker: AEE), employing approximately 9,000 people in Missouri and Illinois; Diabetes@Work was offered at their headquarter office campus in Downtown St. Louis. The City of St. Louis is a municipal government with more than 5,000 employees in a number of departments and locations across the city; Diabetes@Work was made available to the approximately 150 employees working in the Department of Health office building. Bryan Cave is a prestigious international law firm with approximately 500 employees at the headquarter office in Downtown St. Louis, which is where Diabetes@Work participants attended sessions. Smurfit Stone (ticker: SSCC) is an integrated manufacturer of paperboard and paper-based packaging in North America, including containerboard and corrugated containers, and is also a paper recycler; Diabetes@Work participants came from Smurfit Stone's corporate building in West St. Louis County where approximately 500 people work office-based jobs.

Participating employers paid a discounted price of $1,750 per worksite cohort to offer the program to their employees. The discounted price was made available through a Novo Nordisk grant, which underwrote a portion of operating, project management and evaluation expenses.

About the Participants

Sixty (60) people were enrolled in the Diabetes@Work programs across all four worksites. Of these, 37 (or 62%) actively participated and are considered to be participants. Active participation is defined as attending at least 2 of the 11 sessions after enrollment. The cohort sizes ranged from 5 to 14 active participants, the smallest cohort coming from the smallest worksite.

Table 1. Characteristics of Active Participants (n=37)

Gender (% Female)	76%
Type of Diabetes (%)	
Type 2	73%
Type 1	5%
Not diagnosed diabetes	22%
With health insurance (%)	100%

The majority of active participants were women (76%); the mean age was 49.6. Most participants had been diagnosed with Type 2 diabetes (73%) and a few with Type 1 (5%). A considerable number of participants (22%) did not have diagnosed diabetes, but had been told by a physician they had pre-diabetes or knew they had significant risk factors (e.g., family history, weight) for Type 2 diabetes. While the program is designed for patients with diabetes, prior experience suggested that allowing a few participants with pre-diabetes in each

cohort contributed favorably to the group dynamic and positive lifestyle behaviors for non-diabetic participants.

Each participant received a baseline assessment, including measurement of glycemic control (i.e., A1C), blood pressure, weight, self-management behaviors, and diabetes knowledge. A nurse conducted the clinical measurements onsite typically before the first session, at the conclusion of the 3-month program, and again 3 months later (i.e., a total of 6 months after baseline assessment). The mean baseline A1C of all participants was 7.04 ± 1.3, a value which includes those without diagnosed diabetes. The mean baseline A1C of participants with diabetes was 7.3 ± 1.3. Seventy-one percent (71%) of all participants had a baseline A1C greater than 6.5%, a target threshold for optimal diabetes management as recommended by the American College of Endocrinology. Seventy percent (70%) of participants had hypertension (BP > 130/80) at baseline. Upon enrollment, most participants were overweight or obese; the mean weight was 217 ± 51.9. Self-management behaviors and diabetes knowledge were assessed via survey method. The survey results were used by program staff to tailor the program materials around identified gaps in self-management practices and knowledge.

Clinical Results

Glycemic Control. Among all participants with a baseline A1C > 6.5%, glycemic control improved from a group mean of 7.7 to 6.6 from baseline to 6-month follow-up. When censoring cases due to incomplete data, the mean fell from 8.2 to 7.4 at program end (i.e., 3-month follow-up); the improvement in glycemic control was maintained at 6-month follow-up where a mean A1C of 6.9 was observed. While every effort was made to collect A1C data at each interval on all program participants, perfect protocol adherence did not occur usually due scheduling A1C testing onsite at fixed times. Therefore, a paired t-test was selected as the analysis procedure to test statistical significance of observed improvement in A1C from baseline to 3-month follow-up, baseline to 6-month follow-up, and 3-month follow-up to 6-month follow-up. Each one of these paired comparisons indicated a statistically significant improvement in A1C ($p < 0.05$). Refer to Table 2 below and Figure 1 attached.

Table 2. A1C Outcome Measures for Active Participants

	Baseline	3-month Follow-up	6-month Follow-up
With Baseline A1C > 6.5%			
N	27	20	18
A1C (mean ± SD)	7.7 ± 1.1	7.1 ± 1.5	6.6 ± 1.1

Blood Pressure. Seventy percent (70%) of participants had hypertension (BP > 130/80) at baseline. Among participants with baseline and follow-up data for blood pressure (n=27), the proportion of participants with hypertension fell from 70% to 25% at follow-up[2] ($p = 0.001$). Refer to Figure 2, attached. While

[2] If a 6-month follow-up was not available, the 3-month follow-up was carried forward as the estimate of 6-month follow-up. This method of estimation was applied to 8 of 29 cases (or 27%).

blood pressure management is an important aspect of diabetes management, the Diabetes@Work curriculum devotes just a portion of one session to this topic specifically. The dramatic improvement may be attributable to higher levels of patient engagement in self-management, adherence to medications, dietary changes, improved communication with health care providers, lower stress, or other factors. While it may be possible that excess stress/anxiety among participants during blood pressure testing at baseline (which may not have been present post-program due to familiarity with program staff) may have artificially elevated blood pressure and overstated improvement in hypertension control, this does not seem to explain fully the substantial improvement observed.

Table 3. Blood Pressure Measures for Active Participants

	Baseline	Follow-up
N	27	27
Elevated Blood Pressure (>130/80) (%)	70%	25%

Weight. Some participants gained a few pounds; others lost a few pounds. On average, participants lost 1.1% of body weight, a change that is neither clinically meaningful nor statistically significant. The change was meaningful to 5 participants, however, who lost 5% or more of their body weight during the program; one of these participants lost 29 pounds during the 3-months of program sessions.

Conclusions

The experience of BHC members during Y2007 suggests the Diabetes@Work approach delivers improvements in clinical measures of diabetes management, namely glycemic control and blood pressure. The specific causes of these improvements are not known. Moreover, the extent to which observed improvements may be attributable to external factors unrelated to program participation, such as employer-sponsored disease management or health insurance benefits, is also unknown. The collective experience of these 4 BHC member worksites and an experience of the first Diabetes@Work worksite (in 2004) reported previously[3], provide compelling evidence to continue program implementation and further refine program curriculum and materials. Additional research and development is recommended to improve within-worksite participant recruitment, reduce missing data, expand scalability (i.e., number of people served per worksite), and enhance sustainability of health improvement outcomes post-program. Advancement in these three areas is important to yield even more favorable returns on program expenses, including direct (e.g., fees, A1C testing) and indirect costs (e.g., employee time).

In the end, the BHC-SLDC collaboration accomplished a key goal of building experience and endorsement for Diabetes@Work among key employers in the St. Louis region. BHC continues to promote Diabetes@Work to its members and is finding that companies are more willing to participate and pay

[3] The first Diabetes@Work site was the international administrative office of the Lutheran Church (Missouri Synod). Eighteen people with diabetes began and completed the program. Results from this program were first reported as a poster/abstract at the 3rd National Prevention Summit: Washington, DC (2005).

full program cost. In 2008, two BHC members implemented the program at full cost. Diabetes@Work continues to be a core program offering of the St. Louis Diabetes Coalition and has been instrumental in the development of their other community-oriented diabetes education efforts.

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Figure 1.

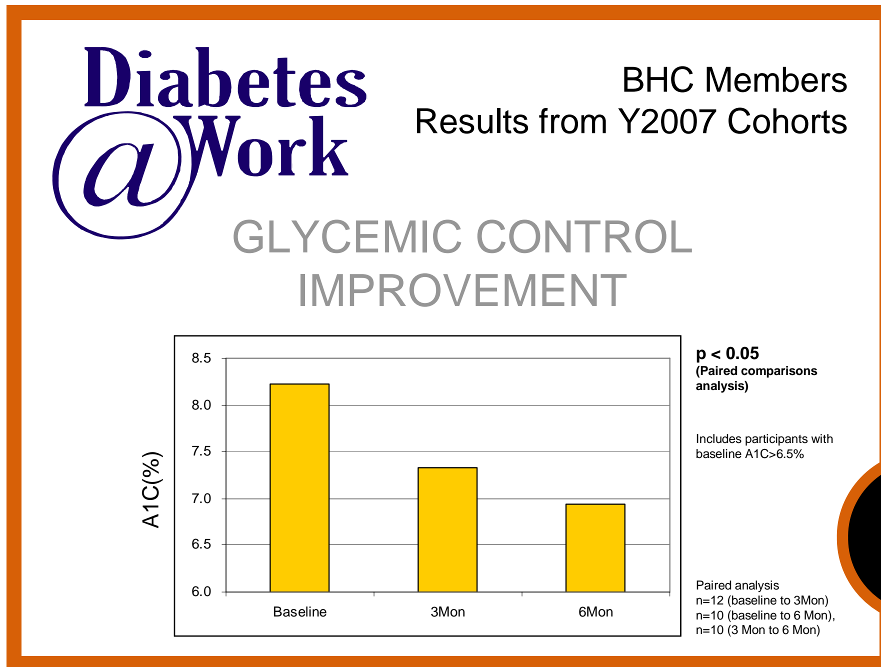

Figure 2.