

## Recruitment for a Diabetes Prevention Program translation effort in a worksite setting



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### ABSTRACT

**Background:** The success of the Diabetes Prevention Program (DPP) lifestyle intervention has led to community-based translation efforts in a variety of settings. One community setting which holds promise for the delivery of prevention intervention is the worksite; however, information regarding recruitment in this setting is limited. The current effort describes the initial processes surrounding provision of an adapted DPP lifestyle intervention at a corporate worksite.

**Methods:** Investigators and key management at the worksite collaborated to develop and implement a recruitment plan for the intervention focusing on 1) in-person onsite activities and 2) implementation of a variety of media recruitment tools and methods.

**Results:** Adult, non-diabetic overweight/obese employees and family members with pre-diabetes and/or the metabolic syndrome were eligible for the study. Telephone pre-screening was completed for 176 individuals resulting in 171 eligible for onsite screening. Of that number, 160 completed onsite screening, 107 met eligibility criteria, and 89 enrolled in the study. Support from worksite leadership, an invested worksite planning team and a solid recruitment plan consisting of multiple strategies were identified as crucial elements of this effective workplace recruitment effort.

**Conclusion:** A worksite team successfully developed and implemented a recruitment plan using existing mechanisms appropriate to that worksite in order to identify and enroll eligible individuals. The results of this effort indicate that employee recruitment in a worksite setting is feasible as the first step in offering onsite behavioral lifestyle intervention programs as part of a widespread dissemination plan to prevent diabetes and lower risk for cardiovascular disease.

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## 1. Introduction

According to the Centers for Disease Control and Prevention (CDC), 86 million adults in the United States have prediabetes, putting them at increased risk for developing type 2 diabetes (1). Many clinical trials have demonstrated that lifestyle modification programs, which focus on physical activity,

nutrition and modest weight loss, can prevent or delay the onset of type 2 diabetes in those at risk (2–4). In the US, the successful Diabetes Prevention Program (DPP) lifestyle intervention has served as the primary model for translation research to the community. The DPP was a multi-site clinical trial that compared lifestyle modification to metformin and usual care in the prevention of type 2 diabetes (4). Results of the trial demonstrated a 58% reduction in the incidence of diabetes in the lifestyle arm and a 31% reduction in the metformin arm as compared to those assigned to usual care, i.e., placebo (4).

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The success of the DPP lifestyle intervention has led to community-based translation efforts in a variety of settings such as the YMCA, primary care practices, hospital out-patient diabetes education clinics, community centers, and churches (5–18). A critical component of community translation is garnering interest in participation in such programs (19). To date, reported DPP translation recruitment efforts in these settings have focused primarily on recruitment methods such as physician referral (7,9,11,14) and community screenings (6,13,20,21). In order to facilitate the prevention potential of lifestyle interventions and maximize their effectiveness it is imperative that program providers have a solid understanding of the barriers and challenges to recruitment in their specific community setting.

One community setting which holds promise for delivery of prevention lifestyle intervention is the worksite (22–25), but information regarding recruitment in this setting is limited. In one DPP translation effort in a worksite setting, Aldana et al. describe recruitment of employees via mass e-mail distribution using the company Internet, posted flyers, and word of mouth (22). In a small pilot worksite project, Barham et al. mailed a risk test to employees and asked them to respond based on their calculated risk score (23). In another example of a DPP translation project at the worksite, Dallem et al. described using screenings and an incentive program to recruit employees (24). While this information is very helpful, reports detailing a more comprehensive strategy for recruitment in the workplace are lacking.

The purpose of this manuscript is therefore to describe the development and implementation of a comprehensive recruitment plan for a diabetes prevention intervention offered in a large corporate worksite. Information regarding onsite preparation for the ensuing program, the screening process, and the characteristics of those enrolled versus not enrolled is provided, as well as a review of barriers encountered and reasons for non-participation. Crude general costs related to recruitment in this worksite setting are also reported. It is anticipated that this information will be useful in the widespread dissemination of lifestyle intervention for diabetes prevention and CVD risk reduction in other worksite settings.

## 2. Methods

The Group Lifestyle Balance (GLB) program, an adaptation of the original DPP lifestyle intervention, has shown to be effective in reducing risk factors for diabetes and cardiovascular disease (CVD) in multiple community settings (9,11,12,14–18). Because of the great potential for lifestyle intervention dissemination in the worksite, the investigators designed a trial to examine the implementation of the GLB program in the workplace, specifically Bayer Corporation, a large international corporation with a worksite in the Pittsburgh metropolitan area. Approximately 1800 individuals are employed at the Bayer Pittsburgh campus.

### 2.1. Study design

The study utilized a randomized control-delayed intervention design (wait list). Participants were randomized to receive their intervention now or later (six-month delayed intervention). At randomization, participants were given the choice to

attend a group version of the intervention delivered on the campus of the worksite or to watch a DVD version of the intervention program. The DVD is a scripted reenactment designed to closely resemble the dynamics of the group version of the intervention (12). Those who chose the group version attended 12 weekly one-hour sessions delivered by a lifestyle coach trained by the Diabetes Prevention Support Center at the University of Pittsburgh. Participants who chose the DVD were phoned once a week by their lifestyle coach to address any challenges and were invited to meet once a month to attend group sessions. Goals of the GLB program are to lose 7% of initial body weight and achieve 150 min per week of moderate intensity physical activity such as brisk walking. Participants learned various behavioral strategies related to modifying their caloric intake and increasing their physical activity to achieve the goals of the GLB. After the initial 12 weeks, all participants were invited to attend bi-weekly sessions and subsequently monthly sessions for the remainder of the year. A complete list of session topics can be found at <http://www.diabetesprevention.pitt.edu/glbmaterials.aspx>.

### 2.2. Establishing a worksite partnership

Initially study investigators met with the worksite medical director to introduce the study and to ascertain interest in offering the program at this worksite. After the confirmation of interest, the medical director garnered support from the executive management team, including the CEO of Bayer Corporation. Additionally, the medical director consulted with an internal legal team to obtain approval for the projected program and study, and to address any potential legal issues related to company participation. Once initial approval was obtained, the medical director identified specific staff members from the medical department to join the planning team, and also facilitated the development of a working relationship between the investigators and the communications department at the worksite. Thus, the onsite planning team was comprised of the medical director, several members of the medical staff (Nurse Practitioner, Physician Assistant and administrator), and members of the marketing and communications department.

After the establishment of the onsite planning team, study investigators worked with this group to discuss best strategies for ensuring successful program delivery at this site. Initially, the collective planning team examined all components of the research study to assure that the effort would be feasible, safe and desirable to the worksite employees. General program implementation issues were also addressed including decisions regarding class scheduling (day and time) and meeting room locations. It was also determined that employees would be permitted to attend classes during their work time hours and that contractors and adult family members would be included in recruitment. This was intended to engage a larger proportion of the employer's stakeholders for whom they had health care responsibilities and cast a wider net among interested individuals thereby increasing the rate of recruitment and participation. The team also addressed planning for how the GLB program would interface with the company's existing wellness program. It was determined that this would not create a conflict because the existing wellness program was exclusively educational and not a coach-led lifestyle behavioral

change program. In order to garner mid-level management buy-in, information about the study and GLB program was conveyed to mid-level management personnel, i.e. Safety Managers, via onsite presentations and monthly online scheduled safety communication. Finally, the onsite planning team was interested in considering options for long-term sustainability. To promote sustainability at the local site, the onsite team requested that one of their medical staff members be trained in the delivery of the GLB program, which was subsequently arranged. It was also decided that long-term sustainability of the program at other company sites would be addressed after the conclusion of the program at the local site.

### 2.3. Development of a recruitment plan

Once the above critical issues had been addressed, the investigators and onsite team worked together to design and implement a plan to create organizational awareness and recruit potential participants for both company management and the general employee population. The recruitment plan focused specifically on 1) in-person onsite activities and 2) implementation of a variety of media recruitment tools and methods.

#### 2.3.1. In-person onsite recruitment activities

The planning team suggested an initial presentation at an ensuing “town hall” meeting for employees, worksite managers, and the company CEO. At this meeting, the CEO introduced the investigators and formally announced the partnership with the University of Pittsburgh to examine the effectiveness of the GLB program in the workplace. Study investigators provided information regarding the background and evidence base of the intervention and the details of study participation. They also discussed the risks and benefits of taking part in the study, and explained that the GLB program was part of a research project and not a company benefit. Worksite managers were encouraged to be as flexible as possible with work schedules to allow employees to attend screening appointments and to participate in the program. Employees were informed that their individual results from the study were confidential and would not be shared with their employer or other employees.

Other onsite in-person activities designed to increase employee awareness and interest in the study involved utilization of “Lunch and Learn” sessions and several worksite health fairs. “Lunch and Learn” sessions were scheduled at times when employees were regularly invited to bring their lunch and receive information on a variety of topics. During the study recruitment phase, these sessions were used by the investigators to deliver brief presentations about the study, and promote interaction with the study team. This allowed for a relaxed and informal way for employees to learn about the GLB program and study and to have their questions answered. Additionally, study investigators and/or members of the study team were in attendance at several worksite health fairs to discuss the program and answer questions. Interested individuals were encouraged to schedule an onsite screening visit when appropriate following the eligibility criteria described below.

#### 2.3.2. Media recruitment tools and methods

After the initial “town hall” meeting, the onsite planning team together with the study investigators worked to develop specific media tools to be utilized during recruitment. The first of these tools was a letter that was sent out by the worksite medical director to the home address of all employees at the site. The letter was designed to inform employees about the study, and to alert them that their adult family members were also potentially eligible to participate. Information about the screening site and dates was included as well. In addition to the letter, informational flyers, large posters, and table tents (to be placed in the company cafeterias) were created and distributed throughout the campus. Informational e-mail blasts were also utilized periodically throughout the recruitment period to remind employees about the study and to encourage them to attend a screening. Finally, an online presentation was developed and was incorporated into regularly scheduled monthly training sessions for company managers. Because the program targets individuals with pre-diabetes and/or the metabolic syndrome, all advertisement tools were tailored specifically to target individuals with these conditions. Initial recruitment focused on encouraging participants to contact the investigators to schedule an onsite screening to determine individual risk.

### 2.4. Screening and participant eligibility

In September 2010, recruitment commenced as described above and continued throughout November 2010. Potential participants were initially screened over the phone by study staff to assess eligibility for an onsite screening which began in October 2010. Onsite screening confirmed eligibility and interest in participating in the study at the worksite.

#### 2.4.1. Eligibility criteria

Employees, contractors and family members were eligible to complete telephone screening. Telephone screening eligibility criteria included:  $\geq 18$  years of age, no previous history of diagnosis of diabetes, not planning to move away in the next 18 months, not pregnant, recently pregnant or planning to become pregnant and self-report of BMI  $\geq 24$  kg/m<sup>2</sup> ( $\geq 22$  kg/m<sup>2</sup> for Asians).

Those found to be eligible at the telephone screening and interested in the program were invited to participate in onsite screening to establish intervention eligibility. Intervention eligibility criteria included: documented BMI  $\geq 24$  kg/m<sup>2</sup> ( $\geq 22$  kg/m<sup>2</sup> for Asians) and evidence of pre-diabetes following the American Diabetes Association criteria, i.e. a fasting glucose of 100 mg/dl–124 mg/dl and/or an A1c level of 5.7%–6.4% (26) and/or the metabolic syndrome as defined by the National Cholesterol Education Program Adult Treatment Panel 3 (NCEP ATP 3) criteria and/or hyperlipidemia and one component of the metabolic syndrome (27).

#### 2.4.2. Onsite screening

During the onsite screening, blood pressure, height, weight, BMI and waist circumference measurements were collected by trained study staff members following a standard protocol. Fasting lipids and blood glucose (minimum of an eight-hour fast), and hemoglobin A1c were also measured via finger stick. In addition, basic demographic information including date of

birth, sex, race/ethnicity, family history of diabetes and heart disease, smoking status, employment status, education level, and other medical history information was collected for each participant. Participants also completed the seven question CDC risk score survey (28).

### 2.5. Information sessions

After the onsite screening, eligible employees, contractors and family members were invited to an information session at which study investigators reviewed the background and evidence for the GLB program and provided a comprehensive overview of what participation in the GLB program would entail. The investigators also addressed the issue of confidentiality of results: employees were assured that their individual results would not be shared with the employer. At this time, preferences for day and time were collected in order to determine the most popular days and time for holding group sessions, and non-employees were informed about logistics for entering the building for attendance at these sessions. Potential participants who were considering enrollment in other outside behavioral weight loss programs were asked to choose between that program and the GLB intervention. Finally, because this was a research study, individuals attending the information sessions were given the study consent to read and review prior to signing at the baseline assessment visit.

### 2.6. Non-participation survey

A small group of individuals who were eligible to take part in the study decided not to participate. A survey of these non-participants was conducted to examine reasons for non-participation. Surveys were mailed by a study team member and requested information on non-participants' relationship to the worksite (employee, sub-contractor, family member), position in the worksite (management, non-management) and whether they were full or part-time. Non-participants were also asked to indicate the reason(s) they chose not to take part in the program, the primary reason for non-participation and to expand upon that reason in a free response question. Those who were mailed the survey were contacted by a research co-investigator twice by phone to answer any questions and to encourage completion of the survey.

### 2.7. Data analysis

Simple descriptive analyses were completed including mean, median and proportions. In addition, of those determined to be eligible for the intervention, the characteristics of participants and nonparticipants were compared. Continuous variables were compared using Student's *t*-test or the Wilcoxon rank-sum test, if data were not normally distributed. Categorical variables were compared using the Fisher's Exact test ( $2 \times 2$  tables) and the Pearson's chi-squared test ( $n \times 2$  tables) using exact procedures. Data management and analysis were performed in SAS 9.3 and StatXact 10 (Cytel Corp.).

## 3. Results

Fig. 1 illustrates the flow of participants through the screening process. A total of 176 individuals were screened

over the phone, with 171 (98%) eligible for and interested in the onsite screening (one person was ineligible and four others declined the onsite screening). Recruitment proceeded at an average rate of 45 participants per month. Of those eligible for onsite screening, 160 (94%) completed a screening and 107 (67%) were found to be eligible. Of the 53 ineligible, 45 (84.9%) did not meet the study criteria for pre-diabetes or the metabolic syndrome, six (11.3%) had fasting plasma glucose or HbA1c levels in the diabetes range and two (3.8%) had BMI  $<24$  kg/m<sup>2</sup>. Of the 107 found to be eligible, 89 (83%) enrolled in the study and were randomized. Eighteen (17%) chose not to take part in the program (non-participants).

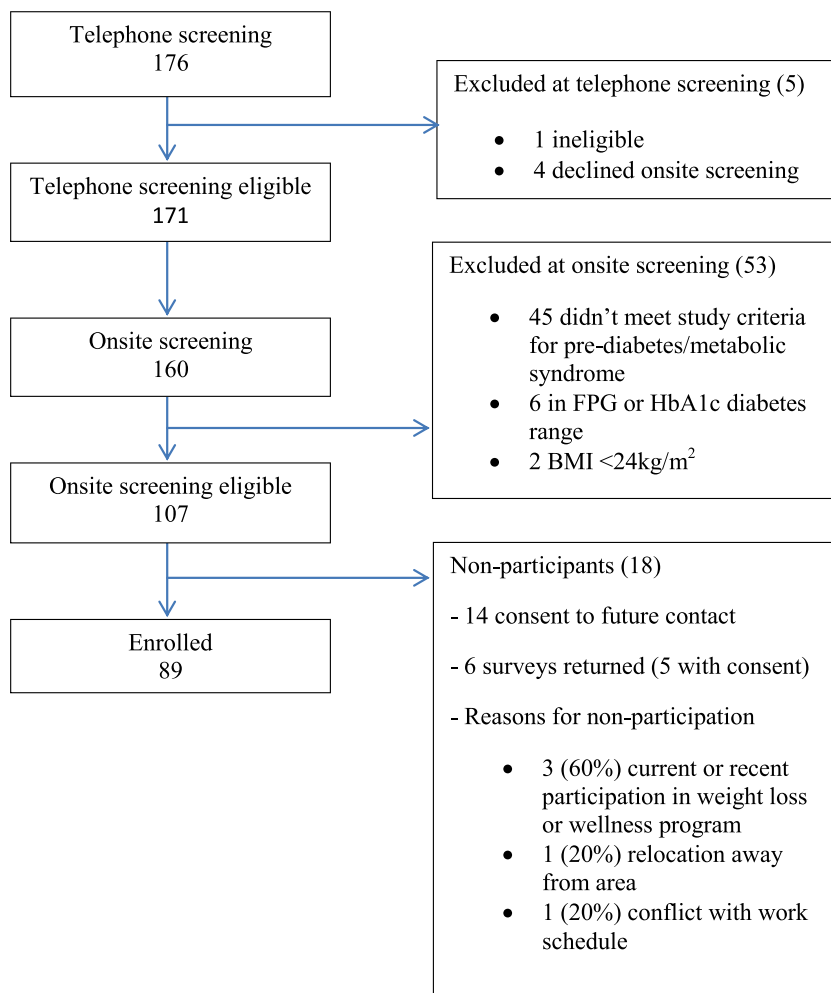
Baseline screening demographic characteristics of study participants are shown in Table 1. The majority were white (93%), female (55%) with an average age of 52 years old. A total of 71 employees and 18 non-employees (13 family members and 5 contractors) took part. Approximately three-fourths of the group reported having a college degree or higher and 89% reported full-time employment. Only 6% reported current smoking, and 9% reported history of gestational diabetes/large baby. Baseline screening characteristics for those who were eligible but chose not to take part (non-participants) are compared to participants in Table 1. Non-participants were significantly younger than participants (47.9 vs. 52.3,  $p = 0.03$ ); however, there were no statistical differences noted between the two groups for any of the other demographic characteristics. In addition, there were no statistical differences noted between participants and non-participants for any baseline clinical measures including BMI, fasting glucose and lipid levels, Hba1c, blood pressure or waist circumference (data not shown).

### 3.1. Non-participant survey

Only 14 of the 18 non-participants had consented at screening to be contacted again in the future. All of the respondents were employees, four were full-time non-management and two were full-time management. Six (42%) surveys were returned, five (35%) of which were accompanied by the consent form and were included in this summary. The most common reason given for not participating (60%) from these five surveys was current or recent participation in a weight loss or wellness program. Relocation away from the area and conflict with work schedule (time) were also indicated as a primary reason for not participating. One individual commented on the use of the word "intervention" in the program name and feared being forced into situations that would cause stress and conflict.

### 3.2. Cost

Although a formal cost analysis was not completed, the general direct costs related to recruitment were calculated based upon expenditures for recruitment materials and marketing within the worksite. Costs reflect recruitment at this campus of 1800 employees, and do not address staff time involved. The costs related to recruitment at this worksite specifically included \$1094 for printing and mailing of 1800 letters to employees, and \$406 for creation of the table tents, flyers and posters, for a total of \$1500.



**Fig. 1.** Participant flow through screening.

#### 4. Discussion

Study investigators partnered with a worksite team to successfully develop and implement a recruitment plan to identify and enroll individuals at high risk for diabetes and heart disease. Multiple simple onsite in-person and media strategies were executed at very little or no cost, including the use of e-mail blasts, provision of onsite informational sessions, and development and utilization of basic printed media such as letters, flyers and posters. Using these strategies, a total of 89 individuals at risk for diabetes and CVD were enrolled, with a recruitment rate averaging of 45 participants per month.

Recruitment rates for DPP translation studies in other settings have varied greatly and eligibility criteria and enrollment methods for each investigation were unique. Amundson et al. coordinated with four health care facilities in Montana and recruited 355 participants over six months, a rate of 59 participants per month (7). Similarly, Blackwell et al. utilized an existing diabetes care center and recruited 301 participants over 21 months resulting in a rate of 14 participants per month (21). Ackerman et al. partnered with the YMCA and recruited

just over 10 participants per month, for a total of 92 participants recruited in nine months (5). Finally, Barham et al. and Aldana et al. implemented DPP translations at the worksite but recruitment rates could not be calculated from the associated manuscripts (22,23). The high recruitment rate noted in this project demonstrates that a successful recruitment plan was effective in efficiently enrolling participants at this worksite for a behavioral lifestyle intervention.

The current study also provided some insight into reasons for choosing not to participate in a translation effort, although it is limited by the fact that the number of participants was small. The only difference found between those who were eligible to participate and chose to do so and the non-participants was that the former were significantly older. This could be due to a variety of factors, with one possibility being that younger individuals perceive issues related to chronic diseases such as diabetes and CVD to be a more distant concern, decreasing the need to make any immediate lifestyle changes. The primary reason reported for non-participation was enrolling or taking part in another weight loss program. Because this was a research study, it was important to isolate the effect of the

**Table 1**  
Baseline screening demographic of participants and non-participants.

Variable	Participant n = 89	Non- participant n = 18	p- value
Age, mean (SD)	52 (7.2)	48 (10.6)	0.03
Sex, n (%)			1.00
Male	40 (44.9)	8 (44.4)	
Female	49 (55.1)	10 (55.6)	
Spanish, Hispanic or Latino, n (%)			0.43
Yes	2 (2.25)	1 (5.6)	
No	87 (97.75)	17 (94.4)	
Ethnicity, n (%)			1.00
Caucasian/white	83 (93.3)	17 (94.4)	
African American	1 (1.1)	0 (0.0)	
Asian	5 (5.6)	1 (5.6)	
Education, n (%)			0.31
High school graduate or GED	2 (2.3)	1 (5.5)	
Some college or technical school	21 (23.6)	1 (5.5)	
College graduate (bachelor's degree)	35 (39.3)	9 (50.2)	
Graduate degree	31 (34.8)	7 (38.8)	
Employment status, n (%)			0.69
Full-time	79 (88.8)	18 (100)	
Part-time	4 (4.5)	0 (0.0)	
Homemaker	3 (3.4)	0 (0.0)	
Retired	2 (2.2)	0 (0.0)	
Disabled/unable to work	1 (1.1)	0 (0.0)	
Worksite employee status, n (%)			0.52
Worksite employee	71 (79.8)	16 (88.9)	
Family member/contractor	18 (20.2)	2 (11.1)	
Smoking status, n (%)			0.68
Never	64 (71.9)	11 (61.1)	
Former	20 (22.5)	5 (27.8)	
Current	5 (5.6)	2 (11.1)	
Given birth to baby >9 lbs, n (%)	8 (9.0)	0 (0.0)	0.33

intervention, so participants were asked to choose between their current weight-loss program and the GLB. In future translation efforts at the worksite, it is unlikely that employers will exclude employees who participate in separate weight loss programs, thus this issue would not be applicable.

Time issues were also noted as barriers to participation in this study. This is interesting to note since employees were permitted to take part in the program during working hours. Since the number of surveys received was very small, the investigators can only speculate about this issue. It is likely that the time barrier to participation was not related only to the time involved in attending class, but also to the total time perceived to be involved in taking part in such programs and making the necessary behavior changes. Although reasons for non-participation in similar studies are sparsely reported; issues related to time constraints have been previously indicated. A survey of non-participants among a cohort of women eligible to participate in a type 2 diabetes lifestyle management program indicated that time requirements of the program accounted for almost 50% of non-participation (29). In one study examining non-participation in a diabetes self-management intervention, Thoelen and colleagues reported issues such as time, transportation, costs and scheduling time for class time as important reasons for non-participation (30). It is important to note that several of these barriers to program participation may be eliminated when providing a healthy lifestyle program at a worksite. In the current study the intervention was offered "on campus",

thus eliminating the need to commute to a program center. Classes were offered during lunch time and did not add to the length of the work day, and participants were also offered a DVD version of the GLB that required meeting only once a month, which provided an option for employees who travel often.

Many important lessons were learned as a result of this evaluation. First, the establishment of a solid support system at the worksite is essential. Worksite leadership was engaged early in the process, continually involved in decision making and routinely updated on progress, thus facilitating preparation for program delivery and recruitment. The strong support from leadership likely influenced the lack of resistance from mid-level managers and subsequent smooth implementation of the GLB program at this worksite. For other employers considering implementation of such programs, a strong message of support from leadership may be critical to buy-in of mid and lower level management. Second, development of a planning team comprised of key members from the worksite was a critical component for success on several levels. For this project, members of the medical and communications department worked together; utilizing their understanding of internal communications and company culture to guide the creation of a recruitment plan that incorporated multiple strategies appropriate for this worksite. Thus, employers contemplating a worksite program intervention should determine who should be included on the planning team in order to address issues of program delivery, i.e. eligibility (pre-diabetes and/or metabolic syndrome, or even just overweight/obesity), program marketing, and participant enrollment. Involvement of a worksite team from the beginning allows for important decisions to be made concerning program delivery at the worksite. Finally, another lesson learned related to employee concerns about how their individual results would be handled, and who would have permission to view them. In this study, the planning team realized the importance of providing assurance to employees that their individual results from screening and the intervention would not be shared with their employer, other employees, or anyone else without their permission. This is an important privacy issue for worksites to be cognizant of as they prepare for implementation of onsite intervention programs.

There are limitations to this evaluation that should be mentioned. This study was not designed to examine specific individual recruitment strategies and therefore comparisons of each individual strategy were not possible. Generalizability to other worksites may be limited due to the lack of ethnic/racial diversity in this group, as well as the study population's high level of achievement of higher education. In addition, the non-participation survey was completed by only six individuals (33% of non-participants); therefore results must be viewed as anecdotal. It is possible that these individuals may not have responded due to privacy issues. It is also important to note that the current report did not include a formal cost evaluation; however, a comprehensive assessment of costs related to all aspects of delivery of the GLB program is currently in progress. Finally, as worksites differ in available resources, such as specific employee characteristics and marketing/communication ability, further investigation into other worksites is needed.

## 5. Conclusions

This investigation has shown that a dedicated team, including worksite members, successfully developed and implemented a recruitment plan using simple strategies to identify and enroll individuals at high risk for diabetes. Substantial interest in program offering from both management and employees suggests that the worksite may be an important setting in which to widely disseminate behavioral lifestyle intervention to prevent diabetes and lower risk for cardiovascular disease. When offering a lifestyle intervention program at a worksite, in addition to examining the effects of the intervention, it may also be helpful to fully evaluate reasons for employee non-participation.

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