



Promoting a Healthier NYC Workforce: Findings from in-person and online programs to prevent diabetes

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EXECUTIVE SUMMARY

The City of New York employs over 380,000 people and is the largest employer in New York City (NYC). In 2015, the City's newly-created workplace wellness initiative, WorkWell NYC, began a pilot implementation of the National Diabetes Prevention Program (NDPP). NDPP is a Centers for Disease Control and Prevention (CDC)-recognized program that aims to prevent or delay the onset of type 2 diabetes. The NDPP is a yearlong, evidence-based program that helps participants at risk of diabetes to eat a healthier diet, increase physical activities, set goals, and manage stress. One of the goals of the NDPP for the participant is to lose 5 to 7% of their initial body weight through moderate changes in both diet and physical activity.

Initially offered in-person at two NYC government agencies, the NDPP was later expanded, and an online version was offered in 2017. The New York Academy of Medicine (NYAM) partnered with WorkWell NYC (a program within New York City's Office of Labor Relations) to evaluate the effectiveness and participant experiences of the two versions. While effectiveness of the NDPP has been evaluated by many, this research contributes to the literature in its focus on worksite implementation and implementation using two modalities.

The evaluation team used a mixed-methods approach that involved 190 participants from seven NYC agencies (129 from the in-person program and 61 from the online program). Participants were asked about their health-related behaviors, challenges, and self-reported health at baseline and after 16 sessions. Weight, attendance, and minutes of physical activity were collected at each session. NYAM also conducted focus groups and interviewed participants after completion of 16 sessions.

At the 16th session, the in-person group had an average weight loss of 10.1 pounds (4.9% of initial body weight), compared to the average weight loss of 6.3 pounds (3.7% of initial body weight) among the online group. The weight loss results were greater than the NDPP average but fell short of CDC's 5% goal. There were improvements in self-reported health, dietary behavior, and physical activity in both groups, but these findings were only statistically significant among the in-person group. While both the in-person and online participants had high levels of engagement and good adherence to the program, in-person participants had higher levels of satisfaction with the program and the lifestyle coach. Both groups noted that offering the NDPP at their workplace made it easier for them to participate.

Reducing the burden of type 2 diabetes through lifestyle intervention is an important strategy to build a healthy workforce. Providing such evidence-based programs in the workplace allows greater participation and engagement. Ongoing monitoring and evaluation can provide important information for quality assurance and improvement for both in-person and online diabetes prevention programs.

BACKGROUND

The National Diabetes Prevention Program (NDPP) is a Centers for Disease Control and Prevention (CDC)-recognized program aimed at preventing or delaying the onset of type 2 diabetes in high-risk individuals. The NDPP is a yearlong, evidence-based lifestyle change program facilitated by a trained health coach.¹ The NDPP, also known as PreventT2 (i.e., prevent type 2 diabetes), follows a standard curriculum and has two components: 16 weekly core sessions during the first six months, followed by six monthly maintenance sessions (22 total sessions). In the core sessions, participants learn how to eat a healthier diet, incorporate more physical activity into their lives, set goals, and manage stress. The second part of the program focuses on enhancing skills learned in the core sessions and maintaining healthy behaviors.

One of the goals of the NDPP for the participant is to lose 5 to 7% of their initial body weight through moderate changes in both diet and physical activity. A randomized clinical trial demonstrated that people with prediabetes who participate and lose weight in the NDPP can reduce their risk of developing type 2 diabetes by 58%.² Based on promising results from many community-based settings,³⁻⁶ the NDPP has been widely implemented by health care providers, health departments, faith institutions, employers, and community organizations. Research on the effectiveness of online versions of the NDPP is still emerging, but a meta-analysis published in 2017 found technology-mediated diabetes prevention interventions demonstrated a significant pooled weight loss effect of 3.76 kilograms (8.76 pounds).⁷

The New York City Office of Labor Relations' (OLR) WorkWell NYC program initially offered an in-person NDPP at two NYC agencies (Department of Health and Mental Hygiene and the Department of Environmental Protection). The program was later expanded to six other city agencies, and an online version was offered in 2017. The online program was designed to ensure access for those working offsite or in locations that did not offer the program onsite. It includes a curriculum similar to the in-person program and has a virtual (human) coach, who is available for one-on-one coaching. The online program also offers a discussion web forum for participants to share their progress and stories. Weight data are collected by wireless home scales provided by the program.

The New York Academy of Medicine (NYAM) partnered with WorkWell NYC to evaluate the effectiveness and participant experiences of the two versions of NDPP from 2016 to 2018. This report focuses on findings collected from the core 16 sessions, since data collection from online participants for a full year was beyond the scope of this evaluation. The research adds to the body of evidence both on workplace implementation of the NDPP and the effectiveness of NDPP delivery online.

METHODS

The evaluation was conducted by NYAM staff at the Center for Evaluation and Applied Research using a mixed-methods approach. Data on healthy behaviors, challenges, self-reported health, and satisfaction were collected using surveys, at baseline and after 16 sessions. Questions assessing eating and physical activity behaviors were taken from the Summary of Diabetes Self-Care Activities (SDSCA)⁸ and a one-item self-report of health status was extracted from the National Health Interview Survey.⁹ Other survey questions were adopted from previous NDPP evaluation instruments developed by NYAM. Weight, attendance, and physical activity data were collected at each in-person session and by the online program provider. Qualitative data were collected through five focus groups with in-person participants and 10 individual interviews with online participants at the completion of 16 sessions. The facilitator used semi-structured discussion guides in the focus group and interviews, and conversations were audio-recorded and transcribed. Participants were given a \$15 incentive for completing the baseline and follow-up surveys and a \$25 incentive for participating in a focus group or an interview. The study protocol was approved by NYAM's Institutional Review Board.

Data analysis included descriptive statistics, as well as paired t-tests (for normally distributed variables) and Wilcoxon paired ranks test (for variables not normally distributed) examining change in weight, physical activity, self-reported health behaviors, and satisfaction measures. Qualitative data from the focus group and interviews were maintained and coded in NVivo 11, a software package for qualitative analysis. Focus group discussions and interviews were coded according to pre-identified themes (e.g., tracking food and exercise, program materials) and analyzed using standard qualitative approaches.¹⁰

FINDINGS

Study Population

For the in-person NDPP, 189 eligible individuals started the program during 2016–2018 at six NYC agencies: Administration for Children's Services (ACS), Department of Education (DOE), Department of Transportation (DOT), Fire Department of New York (FDNY), Human Resources Administration (HRA), and the New York City Housing Authority (NYCHA). To be eligible for the NDPP, participants had to demonstrate they had prediabetes using a recent hemoglobin A1C (blood glucose) test or be at risk for diabetes based on the CDC's prediabetes risk assessment tool.¹¹ Baseline surveys were completed by 108 participants (84% of 129 participants who consented to the evaluation), and 83 participants completed the post-16-weeks survey (64% retention rate).

A total of 232 employees of the NYC Department of Health and Mental Hygiene (DOHMH) enrolled in the online program from late 2017 to early 2018. Sixty-one of the 232 opted to participate in the evaluation following outreach emails from both the DOHMH and NYAM.¹ Baseline surveys were completed by 52 participants (85% of those agreeing to be part of the evaluation). Forty-five participants completed surveys following 16 weeks in the program (87% of the 52 who completed the baseline survey). Two individuals from the DOHMH participated in both the in-person NDPP and the online program. Their survey responses were excluded from the outcome analyses, but their interview data were included in the qualitative analysis as they offer comparative perspectives on how the two programs differ.

Table 1 compares in-person and online program participant demographics. Generally, participants engaged in the in-person NDPP were older ($p = .027$), had worked for the City for longer ($p < 0.001$), were more likely to be Black ($p = 0.002$), and had completed fewer years of education ($p < 0.001$). The gender distribution among the two groups was similar ($p = 0.813$).

¹ Before direct outreach to those enrolled in the program, there was an email sent to DOHMH staff encouraging them to participate in the evaluation. There were 12 additional individuals who consented to the evaluation but were not participants in the online program and therefore have been excluded from this number.

TABLE 1: PARTICIPANT DEMOGRAPHICS

	In-person	Online	P-value
# of Consented evaluation participants	129	61	
# Completed baseline survey	108	52	
# Completed 16-week follow-up survey	83	45	
Agency Participation in Evaluation			
Administration for Children's Services (ACS)	13	-	
Department of Education (DOE)	20	-	
Department of Transportation (DOT)	12	-	
Fire Department of New York (FDNY)	26	-	
Human Resources Administration (HRA)	5	-	
New York City Housing Authority (NYCHA)	26	-	
Dept of Health & Mental Hygiene (DOHMH)	-	61	
Average Age(in years)	51.7 (33 to 71)	47.9 (23 to 73)	0.027
Gender (%)			
Female	87.6%	85.2%	0.813
Male	12.4%	14.8%	
Race/Ethnicity (%)			
Black	66.7%	39.3%	0.002
Latino/Hispanic	19.4%	18.0%	
White	18.6%	24.6%	
Other	13.2%	8.2%	
Asian	1.6%	9.8%	
Average years working for NYC	21.4 (0.1 to 43)	15.2 (0.5 to 39.0)	<0.001
Highest Level of Education (%)			
Did not complete high school	0.9%	0%	<.001
High school or GED	4.5%	0%	
Some college or two-year degree	24.5%	11.5%	
College (4 years)	53.6%	40.4%	
Graduate school or higher	16.4%	48.1%	

Attendance, Weight Loss, and Overall Health

Among in-person participants consenting to the evaluation, 11 did not attend any sessions, and five dropped out. Approximately 90% of participants completed at least nine of the 16 core sessions, which is the minimum number of sessions considered completion of the NDPP. Among them, the average number of sessions attended in-person was 13.8. Participants completed an average of 1.9 make-up sessions, bringing the total sessions completed (in-person plus make-up) to 15.8. Make-up sessions are offered by the lifestyle coach to individuals who miss an in-person session. Sixty-four percent of online participants (n=37) completed all 16 core sessions and 76% (n=44) completed at least nine. Twenty-four percent (n=14) completed eight or fewer sessions.

Average baseline weight was 210.4 pounds for in-person participants and 202.2 pounds for online participants. On average, in-person participants lost more weight after 16 sessions than online participants (Table 2). In-person participants lost an average of 10.1 pounds (range: +8 pounds to -30 pounds), representing an average weight loss of 4.9% of their original body weight (range: +3% to -14%). Forty six percent of in-person participants (n=52) lost 5% or more of their original body weight. Online participants lost an average of 6.3 pounds (range: +11.5 pounds to -65.7 pounds), representing an average weight loss of 3.7% of their original body weight (range: +5.8% to -28.4%). Twenty-two percent (n=13) of online participants lost 5% or more of their original body weight.

TABLE 2: COMPARISON OF WEIGHT LOSS OUTCOMES BETWEEN IN-PERSON AND ONLINE GROUPS

	In-person	Online
Average weight change after 16 sessions, in pounds	-10.1 (Range: +8 to -30)	-6.3 (Range: +11.5 to -65.7)
Average percent weight change after 16 sessions	-4.9% (Range: +3% to -14%)	-3.7% (Range: +5.8% to -28.4%)

Participants in both the in-person and the online programs remarked on improvements to their overall health, wellness, and clinical biomarkers, such as A1C levels.

Yes, and my A1C went down, and it went down a great bit, and my doctor called, and she was like, "I don't know what happened. No, no, no, don't panic. I'm just calling to let you know your A1C went down, this is better." (In-person participant)

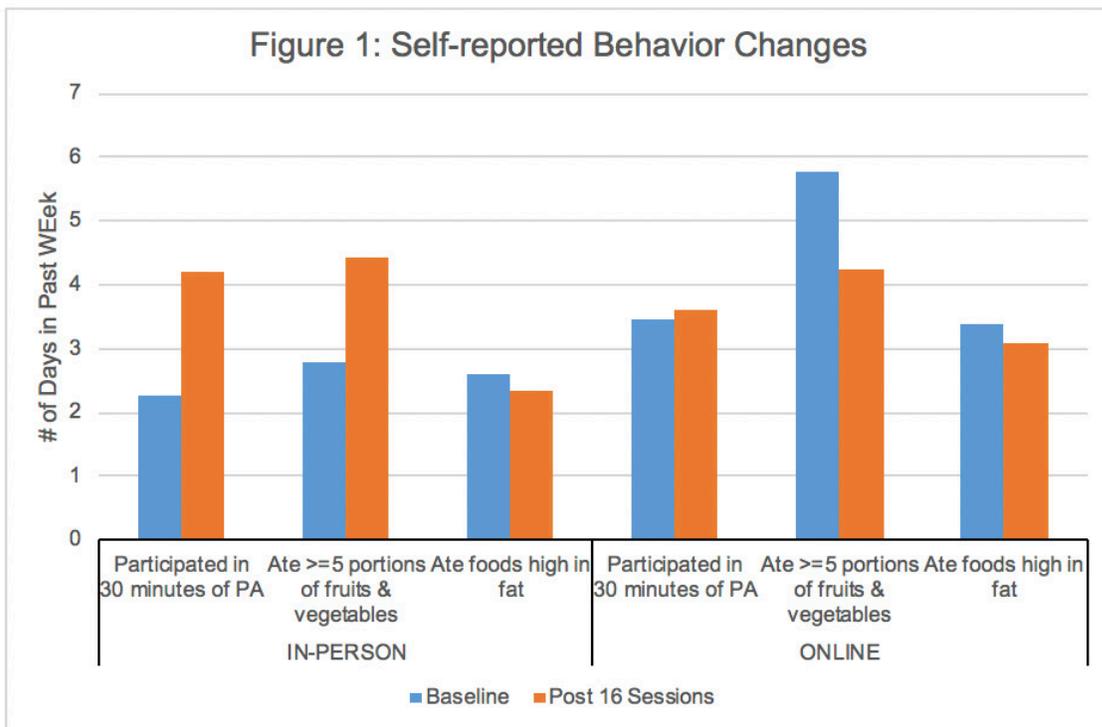
I do feel a whole lot healthier. I feel a lot happier, and I feel more conscious of me and what I eat. (Online participant)

This program is just awesome; the benefits are immeasurable. At 64 years young, I am seeing and feeling the best. I can transition into retirement knowing I am healthier than ever and look forward to years of healthy eating and exercise. [At the] start of program my A1C was 6.1. It is now 5.2. (Online participant)

Self-reported Behavioral Change

To assess behavioral changes, baseline and follow-up surveys asked participants to report the number of days they engaged in at least 30 minutes of physical activity, the number of days that they consumed five or more portions of fruits and vegetables, and the number of days they ate foods high in fat.

In-person participants reported statistically significant increases in healthy behaviors (i.e., physical activity and eating more fruits and vegetables, $p < 0.0001$) and modest decreases in unhealthy behaviors (i.e., eating foods high in fat, $p = 0.232$). Online participants, on the other hand, reported a modest increase in physical activity and a decrease in the number of fruits and vegetables consumed, though neither were statistically significant (Figure 1).



In interviews and focus groups, both online and in-person participants described changes to their diet and physical activity. Reduced overall consumption, smaller portion sizes, and eating less sugar and fewer processed foods were among the most important changes reported. Participants also described efforts to incorporate physical activity into their daily routines, including using the stairs or walking more often.

That I know how to eat in moderation since I was overeating myself. And when I learned how to eat in moderation, I look at the food, and I know it's too much. (In-person participant)

I'm eating less sugary foods. Less emotional eating ... I'm eating more vegetables. And I'm trying to eat more regularly. Like on more of a schedule. (Online participant)

One of the things that I did learn was that it was simple things that you can do. That it didn't have to be strenuous exercise. Because you think exercise, you think going to the gym, lifting the weights, running on the treadmill or whatever. When it could just be simple things that you can do. Getting off the bus a stop early or just—you know. Just little things. [In-person participant]

Program Satisfaction

Although both the in-person and online programs were well-received, the in-person participants had higher levels of satisfaction with the program overall and with the lifestyle coach (Table 3). There were also statistically significant differences in the level of satisfaction with the program materials.

TABLE 3: COMPARISON OF LEVELS OF SATISFACTION BETWEEN THE IN-PERSON VERSUS ONLINE PROGRAMS

	In-person (n=83)	Online (n=45)	P-value
Satisfaction with overall quality of the programs			
Very Satisfied	78.3%	35.6%	<0.001
Satisfied	21.7%	46.7%	
Neutral	–	8.9%	
Dissatisfied	–	2.2%	
Strongly Dissatisfied	–	6.7%	
Satisfaction with lifestyle coach			
Very Satisfied	91.6%	31.1%	<0.001
Satisfied	8.4%	37.8%	
Neutral	–	17.8%	
Dissatisfied	–	6.7%	
Strongly Dissatisfied	–	6.7%	
Satisfaction with the quality of the program materials			
Very Satisfied	61.4%	46.7%	0.049
Satisfied	28.9%	37.8%	
Neutral	8.4%	4.4%	
Dissatisfied	1.2%	4.4%	
Strongly Dissatisfied	–	6.7%	

One hundred percent of the in-person participants reported being very satisfied or satisfied with their NDPP coaches. This sentiment was echoed and reinforced by the general comments received at the end of the survey and in the focus groups. Participants highlighted the energy of their coaches, their ability and willingness to share their own stories of struggles, and the ability to keep the group motivated.

She shared a lot of her personal stories with us as well. She was struggling and challenging too, so it made it easier for us to relate to her. (In-person participant)

She was great, very fun and informative. She gave words of encouragement in the emails. Made it fun and interesting; which encourages you to keep going. (In-person participant)

The two individuals who participated in both the in-person and online programs noted that the online program offered reinforcement and continued support after they completed the in-person sessions. One participant also noted that the one-on-one coaching and ongoing monitoring offered through the online sessions helped improve awareness of eating habits in a way that hadn't happened in the in-person sessions.

I knew that the classroom DPP was coming to an end, and I felt that I just needed additional support. Even though, well, what's interesting is that even though I learned a lot in the classroom one, the online one was the one that really honed into what I was eating, because I was tracking, and it was being monitored by the online coach. So, the online coach was able to point out to me what [foods] I needed to maybe eat less of or maybe steer away from. ... I learned a lot more of what I needed to change in my eating habits. (In-person and online program participant)

The area in which the online and in-person participants were most similar was their opinions of the program materials (Table 3). The two participants who did both programs felt that the online program materials were better than the NDPP curriculum but emphasized that the two modes of delivery complemented each other well.

But the online ... I thought [the materials] were phenomenal. ... I don't know what made it phenomenal, but it was just the way they teased everything out; the references, the resources, they were just teased out so well that you wanted to read it and you're able to apply many of the references that was discussed in the online. (In-person and online program participant)

The in-person sessions that I participated in were facilitated by a wonderful facilitator. She's just nonjudgmental, kept the group together, everybody enjoyed coming to the sessions, but the materials were not as good as [the online provider]. ... So, I think the combination of the two was very helpful to me. ... I think the complementing is very important, very helpful. (In-person and online program participant)

Benefits of Having the Program In-person Versus Online

In the follow-up survey after 16 sessions, most in-person participants (98%) agreed or strongly agreed that having the NDPP at the workplace made it easier for them to participate. Few participants noted barriers to engage,² and overall, participants felt that their agency was supportive of their participation. Focus group participants reported that the in-person program helped to build relationships with colleagues. They enjoyed the support from other participants and the opportunity to get to know their coworkers better.

I think we all look forward to Wednesdays for us to get together. We all have so much in common. And then we exchange our feelings. And it's an open group. And we've become family. (In-person participant)

I like the group aspect of it. In the past, I've worked alone with a nutritionist and while that was helpful, it was sort of all on me. And I sort of feel the support of the group is very helpful. (In-person participant)

Most online participants (93%) agreed or strongly agreed that an online wellness program made it easier for them to participate than having the program at their workplace. Several interview participants noted that they are unable to participate in programs offered in person, due to the location of their work assignment or schedule constraints. They also appreciated being able to review the lessons and materials outside of work hours.

I would not have been able to attend something at my workplace. There's no way. I don't have the time. This is convenient because when I didn't have anything to do, downtime at work or downtime at home, or downtime while I'm hanging outside, I could just look at my phone and do that. ... I would not do it if it was someplace to go or in the job because I'm just too busy. (Online participant)

I think, because of so many life factors, it was just so much easier to be able to do things on my own time and not, you know, have to kind of check in on ... a regular basis. I could do it when I was able to do it. I could do it on the train platform or on my lunch break, but I was able to kind of keep up at my own pace. (Online participant)

² There were a few instances when participants noted conflicts with their schedules or supervisors, but this was rare. One participant noted in the final survey that they felt "discussing personal business like health and weaknesses in front of co-workers can be a deterrent," but that was the only instance where that was discussed.

DISCUSSION

The WorkWell NYC NDPP, which was implemented in-person and online for staff of NYC government agencies, had high levels of engagement, good adherence, and high levels of satisfaction. Overall, participants lost weight, although only 38% of participants (in both programs) reached or exceeded the CDC 5% weight loss goal. Comparing the two programs, the in-person NDPP participants lost a larger percentage of body weight, had more noticeable and significant improvements in self-reported health behaviors, and reported greater levels of satisfaction compared to the online program. Additionally, the in-person program results compared favorably to a recent national evaluation of the NDPP, which showed an average of 4.2% weight loss.¹² Also, the in-person WorkWell NYC participants attended more sessions than the national average.¹²

The relative success of the program may be in part due to convenience: access either at work or via the internet facilitated continued engagement. Coach quality also seems important, particularly for the in-person sessions. The in-person NDPP coaches were reported to be highly responsive to participants. The high degree of satisfaction with the coaches may be attributed to the fact that NDPP coaching is a full-time salaried position in the WorkWell NYC program, facilitating recruitment of individuals with greater skills and experience, and allowing them to devote greater energy and time for the sessions. Full-time coaches are rare in the NDPP; coaching is usually the responsibility of a part-time person, a volunteer, or a staff member with other duties.

However, the online program may allow for a broader reach since it would not necessitate an expansion in the number of full-time lifestyle coaches. Given these tradeoffs, this evaluation may inform strategies to adapt program offerings that accommodate the composition and needs of employees to optimize the City's efforts in shaping a healthier, more productive workforce.

This evaluation had several limitations. The sample size was relatively small. Most in-person participants were coached by the same individual, making it difficult to separate the program effect from the coach effect. The two groups differed from one another in terms of race/ethnicity, level of education, age, length of employment, and agency affiliation. Furthermore, the participants were not randomly assigned to the in-person or online programs, so direct comparisons of outcomes between the two groups are not possible.

Nevertheless, the use of multiple data sources and the mixed methods approach added nuance and helped further elucidate factors that may influence real-world implementation of these programs in the workplace. Online versions of the NDPP are relatively new, and research documenting their effectiveness is nascent. This report adds to a growing body of evidence evaluating their effectiveness in comparison to the in-person program,¹³ which has been widely adopted and evaluated.

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