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Tailoring an evidence-based lifestyle intervention to meet the needs of women Veterans with prediabetes

Karen E. Dyer, PhD, MPH^a, Jessica L. Moreau, PhD, MPH^a, Erin Finley, PhD, MPH^{a,b,c}, Bevanne Bean-Mayberry, MD, MHS^{a,d,e}, Melissa M. Farmer, PhD^a, Dorothy Bernet, MS, RDN^e, Arthur Kress, MS, RD, LDN^e, Jackie L. Lewis^a, Fatma K. Batuman, MD, FACP^{d,e}, Sally G. Haskell, MD^{f,g,h}, Alison B. Hamilton, PhD, MPH^{a,d}, Tannaz Moin, MD, MBA, MSHS^{a,d,e}

^aVHA HSR&D Center for the Study of Healthcare Innovation, Implementation & Policy (CSHIIP), VA Greater Los Angeles Healthcare System, Los Angeles, California, USA

^bVeterans Evidence-based Research, Dissemination, and Implementation Center (VERDICT), South Texas Veterans Healthcare System, San Antonio, Texas, USA

^cDepartments of Medicine and Psychiatry, University of Texas Health Science Center, San Antonio, Texas, USA

^dUCLA David Geffen School of Medicine, Los Angeles, California, USA

^eVA Greater Los Angeles Healthcare System, Los Angeles, California, USA

^fWomen's Health Services, Veterans Health Administration, Washington, District of Columbia, USA

^gVA Connecticut Healthcare System, West Haven, Connecticut, USA

^hYale University School of Medicine, New Haven, Connecticut, USA

Abstract

Prediabetes affects one-third of U.S. adults. Lifestyle change interventions, such as the Diabetes Prevention Program (DPP), can significantly lower type 2 diabetes risk, but little is known about how the DPP could be best adapted for women. This mixed-methods study assessed the impact of gender-tailoring and modality choice on DPP engagement among women Veterans with prediabetes. Participants were offered women-only groups and either in-person/peer-led or online modalities. Implementation outcomes were assessed using attendance logs, recruitment calls, and semi-structured interviews about patient preferences. Between June 2016 and March 2017, 119 women Veterans enrolled in the DPP ($n = 51$ in-person, $n = 68$ online). We conducted 22 interviews between August and September 2016 ($n = 10$ early-implementation) and March and July 2017 ($n = 12$ follow-up). Most interviewees preferred women-only groups, citing increased comfort, camaraderie, and mutual understanding of gender-specific barriers to lifestyle change. More women preferred online DPP, and those using this modality participated at higher rates.

CONTACT Karen E. Dyer karen.dyer@va.gov VHA HSR&D Center for the Study of Healthcare Innovation, Implementation & Policy (CSHIIP), VA Greater Los Angeles Healthcare System, 11301 Wilshire Boulevard (151), Los Angeles, CA 90073.

Note

Declaration of interest statement

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Most endorsed the importance of modality choice and were satisfied with their selection; however, selection was frequently based on participants' personal circumstances and access barriers and not on a "preferred choice" of two equally accessible options. Patient engagement and program reach can be expanded by tailoring the DPP for population-specific needs.

Keywords

Diabetes prevention; gender differences; implementation science; patient engagement; social support; Veterans; weight loss

Introduction

Prediabetes affects one-third of U.S. adults and can significantly increase the risk for type 2 diabetes (CDC 2018a). Several large, randomized controlled trials have demonstrated that intensive lifestyle interventions, including the Diabetes Prevention Program (DPP), can lower the risk of incident diabetes by as much as 58 percent (Knowler et al. 2002; Li et al. 2008; Lindstrom et al. 2003). Based on this evidence, the Centers for Disease Control and Prevention (CDC) launched the National DPP Initiative to increase access to and engagement in the DPP (CDC 2018b). However, despite these ongoing efforts, it is estimated that less than 10 percent of those with prediabetes are aware of their diagnosis, and few have engaged in DPP-based lifestyle interventions (Aziz et al. 2015; Geiss et al. 2010).

Persistent gender disparities in controlling modifiable diabetes risk factors underscore the importance of innovative approaches to target and promote diabetes prevention in women. Women, in general, are more likely than men to be obese and less likely to be active (Ladabaum et al. 2014; Ng et al. 2014), while women with diabetes have higher rates of complications, comorbidities, physical and cognitive limitations, depression/anxiety, and health-care costs (Kautzky-Willer, Harreiter, and Pacini 2016; Williams et al. 2017). Moreover, women face substantial barriers to lifestyle change and DPP participation, such as low prediabetes awareness and the existence of competing demands (Gopalan et al. 2015; Lie et al. 2013; McArthur et al. 2014). Specific to women Veterans, up to one-third of this population receiving health care from Veterans Affairs (VA) live in rural areas, where time and distance may make it difficult to attend the DPP or the VA standard-of-care weight management program (MOVE!) (Brooks et al. 2014). Some women Veterans are reluctant to attend VA-sponsored programs due to the male-dominated environment of many VA facilities (Fontana and Rosenheck 2006; Rossiter and Smith 2014). Although women are the fastest growing group of Veterans (VA 2017), they constitute just 8 percent of the patients in the VA health system, which has historically served mostly men (Frayne, Phibbs, and Saechao et al. 2018).

Achieving optimal patient engagement in diabetes prevention has been challenging both within and outside the VA, prompting researchers to think more creatively about how best to connect with hard-to-reach populations. Tailoring the DPP to include gender-specific groups and asynchronous online modalities may address important barriers. First, evidence from weight loss trials has pointed to gender differences in participant preferences and responses

(Robertson et al. 2016), and prior research with Veterans has demonstrated that women-only groups can provide a beneficial, non-threatening setting for health education and support on a range of topics (Ades et al. 2017; Dognin et al. 2017; Martinez et al. 2015; Sedlander et al. 2018). This may be especially important in the VA, where 49 percent of women Veterans report a history of military sexual trauma (Barth et al. 2016), and the male-dominated environment may provoke trauma-related distress (Gilmore et al. 2016). Second, web-based interventions offer greater flexibility and convenience and are associated with positive behavioral outcomes and cost-effectiveness (Ali, Echouffo-Tcheugui, and Williamson 2012; Wantland et al. 2004), including web-based DPP translations (Moin et al. 2015, 2018).

This project builds on previous work demonstrating successful DPP translation to the mostly male VA population and the effectiveness of in-person and online DPP modalities (Moin et al. 2015, 2017, 2018). As part of a quality improvement initiative in a large VA health-care system, women Veterans with prediabetes were invited to participate in a 12-month tailored DPP, which included women-only groups and a choice between an in-person, peer-led modality or an online modality. This mixed-methods study assessed the impact of gender-tailoring and modality choice on women Veterans' perceptions of and engagement in tailored DPP.

Materials and methods

Setting

Tailored DPP was implemented at one large VA health-care system from 2016 to 2018. This project was funded through the EMPOWER Quality Enhancement Research Initiative, a national program of implementation research on women Veterans' health care (Hamilton et al. 2017).

DPP participant identification and recruitment

We screened VA electronic medical record (EMR) data to identify women Veterans with prediabetes (HbA1c 5.7–6.4 percent in prior 12 months) who were overweight or obese per initial CDC program standards (body mass index [BMI] ≥ 24 kg/m²) (CDC 2011) and had at least one primary care provider (PCP) visit in the previous 12 months. We excluded women with prior diagnosis or history of diabetes (i.e., any HbA1c >6.4 percent, or use of antidiabetic medications other than metformin), who were pregnant or planning to become pregnant, or already participating in MOVE! or a DPP.

After notifying the PCPs of women Veterans who met initial EMR eligibility criteria, we mailed invitation letters on behalf of those PCPs. Women Veterans who did not opt-out of being contacted received follow-up telephone calls. Eligible volunteers were enrolled in their preferred DPP modality, either in-person or online. In 2016, we screened 874 EMRs, and 541 women Veterans met initial eligibility criteria. Among the 302 women (55.4 percent) reached by phone, 216 (72 percent) expressed interest in tailored DPP options. Between June 2016 and March 2017, we enrolled 119 women Veterans (55.1 percent) in the tailored DPP ($n = 51$ in-person and $n = 68$ online).

DPP interventions

Interventions used CDC-approved DPP curricula emphasizing intensive lifestyle change and standardized goals, including 5 percent weight loss and 150 minutes/week of moderate physical activity. In-person groups used the Group Lifestyle Balance curriculum, consisting of twenty-two 1-hour core sessions over 12 months (high-touch/low-frequency) (DPSC 2017). The curriculum has demonstrated effectiveness in both clinical and non-clinical settings (DPSC 2017; Kramer et al. 2011; Tang et al. 2012). Sessions were led by a woman Veteran peer coach who had successfully participated in the DPP four years prior and later completed CDC coach training. A female professional registered dietitian with experience in delivering the DPP helped train, support, and supervise the coach. Closed women-only groups were held at VA Medical Center sites. Participants self-monitored their diet and activity levels, and the coach and dietitian provided individualized feedback on their food journals.

Online groups used a commercially available DPP intervention known as *Prevent*, developed and administered by Omada Health (www.omadahealth.com) (Sepah, Jiang, and Peters 2015). The program leverages social media principles to deliver a virtual DPP asynchronously in an online closed-group format. A certified professional female health coach employed by Omada Health was assigned to each group to deliver the curriculum, answer questions, and monitor interactions to ensure an appropriate, positive virtual environment. The online DPP included 52-weekly modules over 12 months (low-touch/high-frequency). Omada Health altered the initial *Prevent* format after launching the online groups; instead of assigning participants to women-only groups for the program's duration, they were transitioned after 16 weeks to larger, mixed-gender groups.

Data collection

Quantitative data were collected from all enrolled participants during initial recruitment telephone calls and through in-person or online routine check-in procedures. During recruitment calls (described above), women were queried about their prediabetes diagnosis and prior participation in any VA or non-VA lifestyle intervention. Coaches took attendance and conducted weight assessments during each in-person session. *Prevent* logged module completion by online participants; participants weighed themselves using wireless scales provided by Omada Health.

Qualitative data on patient preferences, experiences, and satisfaction were collected from a random subset of DPP enrollees using semi-structured telephone interviews at early-implementation and post-implementation (follow-up) time-points. A project staff member telephoned selected enrollees, described the interview's purpose, and scheduled participation if appropriate. Fourteen women were contacted for early-implementation interviews; of those, ten completed interviews, two declined, and two were unreachable (the participation rate among those successfully reached was 83 percent). We attempted follow-up interviews with all early-implementation interviewees but recruited additional participants in place of those we could not reach. A total of 28 women were contacted for follow-up interviews, including all ten early-implementation interviewees plus an additional eighteen women randomly selected from the original pool of DPP enrollees. Of the 28 contacted, thirteen

completed interviews (seven early-implementation interviewees and five new recruits), four declined, one was ineligible, and eleven were unreachable (participation rate = 76 percent). Interviews were audio-recorded and transcribed verbatim. Participants gave verbal consent at the time of the interview. All procedures were approved as designated exempt research by the local Institutional Review Board.

Measures

We assessed patient and implementation outcomes using mixed methods over 12 months of follow-up. The quantitative primary outcomes of interest included participation and weight change among all DPP enrollees. We defined participation as the number of DPP sessions/modules attended; participants who attended 9 were considered “completers,” per CDC national guidelines on minimum thresholds for engagement (CDC 2018b). We defined weight change as the difference between weight at baseline and 12 months. For participants without the 12-month weight assessment, we carried forward the last available weight. Additional measures included computed BMI (in kg/m²) using self-reported height and objective weight measurements collected by DPP coaches (for in-person groups) or Omada-provided wireless scales (for online groups); participant awareness of her documented prediabetes diagnosis (1 = yes); and previous participation in lifestyle interventions (1 = any). Qualitative domains of inquiry included participants’ overall experience and satisfaction with the DPP, preferences regarding gender-tailoring and modality choice, barriers and facilitators to program participation, and recommendations for program improvement.

Analytic strategy

Descriptive statistics (means and frequencies) were calculated for quantitative variables (participation, weight change, prediabetes diagnosis awareness, and previous participation in lifestyle interventions). The study was not powered to examine weight differences between DPP modalities, so differences between groups were not tested. For qualitative analyses, we first summarized interviews in a template outlining key domains identified *a priori*. We then used matrix analysis to assess the depth and breadth of information and to inform the development of a preliminary codebook (Averill 2002; Hamilton 2013). We imported de-identified transcripts into qualitative analysis software (ATLAS.ti v.8, Scientific Software Development GmbH, Berlin) for targeted coding of data specific to gender-tailoring and modality choice, and further refined the preliminary codebook after coding a subset of data using an iterative approach (Miles, Huberman, and Saldaña 2014). All transcripts were coded by the first author (KD) and checked by the second author (JM), both medical anthropologists; discrepancies were resolved through discussion and consensus. We sorted transcripts by participants’ chosen DPP modality (in-person or online) and generated output of coded text to facilitate data display, the grouping of related text segments, and the identification of patterns and themes. Themes were developed and refined through an iterative team-based process of constant comparison (Miles, Huberman, and Saldaña 2014) and checked for quality and consistency by a study PI (AH).

Results

Less than one-third ($n = 90$) of women reached by phone were aware of their documented prediabetes diagnosis, and only 16 percent ($n = 49$) had previously participated in a lifestyle intervention within or outside VA. Among women interested in the tailored DPP, more women favored online DPP (74 percent, $n = 160$) than in-person (24 percent, $n = 51$). In-person participants were on average somewhat older than online participants (57 years versus 54 years, respectively), more racially/ethnically diverse, and more geographically concentrated in terms of the VA clinic attended. Mean baseline A1c and BMI values were comparable, though in-person participants tended to report more comorbidities (Table 1). Of the 51 in-person participants, only 27 percent ($n = 14$) completed 9 of 22 sessions; a high proportion of non-completers had not attended a single session ($n = 29$; 78 percent of non-completers) (Table 2). Mean weight loss among in-person participants who attended 1 session and had 1 documented follow-up weight measurement ($n = 22$) was 3.1 pounds (SD = 6.5 pounds). Of the sixty-eight online participants, 66 percent ($n = 45$) completed 9 of 52 modules. Mean weight loss among online participants who completed 1 module and had 1 documented follow-up weight measurement ($n = 59$) was 7.1 pounds (SD = 11.9 pounds).

Between August and September 2016 and March and July 2017, we conducted twenty-two interviews with both in-person participants ($n = 6$ early-implementation, $n = 6$ follow-up) and online participants ($n = 4$ early-implementation, $n = 6$ follow-up). Of the twelve follow-up participants, three reported quitting the program early (two online, one in-person) and three reported significantly reduced attendance (two online, one in-person). Regardless of completion status or selected modality, interviewees reported increased knowledge about prediabetes and effective management strategies (i.e., diet and exercise). The following sections present qualitative findings on patient perspectives related to DPP gender-tailoring and modality choice (Table 3).

Gender-tailoring

Nearly all participants preferred a women-only format; no substantive differences were observed between groups regarding gender-tailoring preferences. Roughly one-third reported being theoretically open to including men in the groups but nonetheless enjoyed and appreciated a women-only format. They repeatedly cited the camaraderie, support, and understanding fostered in women-only settings, as articulated by the following participants¹:

[Q: What did you like most about the program?] A: Everything. Meeting the other ladies and hearing their stories and [the coach] when she would tell us her story. The camaraderie with the other Veteran women, in particular, and being able to be open (age 44 years, in-person, FI).

When you have other people that are experiencing the same experiences, then it's like, "Okay, I'm not going through it by myself – I'm not alone" (age 38 years, online, EI).

¹-Quote labels denote participant age, selected DPP modality, and interview time-point (i.e., early-implementation interview [EI] or follow-up interview [FI]).

For many, this woman-only preference was strongly related to shared military background and opportunities to meet and socialize with other women Veterans:

We all went through the same thing and it was just like a sisterhood that I remember from the military (age 50 years, in-person, FI).

I feel like as Veteran women, we should have a group specifically just for us so we could be able to voice our opinions. We felt so good being able to meet other female Veterans and encourage each other and talk about whatever we felt like talking about without males in there (age 44 years, in-person, FI).

Participants described a mutual understanding of gender-specific barriers to weight loss or discomfort talking openly about personal body and weight issues around men. For example:

I really, really like that it's only women; that you could talk and be open and not feel uncomfortable, because sometimes as a woman you don't want to talk certain stuff around a man, and you don't feel comfortable with your body type (age 44 years, in-person, EI).

If you've ever dieted with a man, it sucks. Because they drop weight like crazy. We have a bit more of a struggle, and it's nice to have other women to commiserate with instead of, you know, a male sighing going, "Well I don't know why it's not working for you ... " (age 41 years, online, FI).

A few participants also referenced a personal history of post-traumatic stress disorder (PTSD) or military sexual trauma as a reason for preferring women-only groups:

I prefer being with just women. We have the same situations. And with my PTSD, I'd rather be with women (age 61 years, online, FI).

Modality choice

Reasons for modality selection—Women's reasons for selecting the in-person modality were primarily social in nature: meeting new people (especially women Veterans), receiving support and encouragement, and not feeling alone in making life changes. They generally preferred face-to-face interaction, believing it directly facilitated weight loss via the sharing of ideas and information. For example:

I got to meet people and listen to stories and see that I'm not alone in this. It's just easier for me to be around people to get that motivation (age 50 years, in-person, EI).

I like face-to-face because I learn better from talking to somebody that might know more than me. You learn from other people (age 44 years, in-person, EI).

Others reported lacking a computer, not being "tech-savvy," or disliking the potential drawbacks of online programs, such as decreased accountability or delays in getting questions answered:

I'm a dinosaur when it comes to computers (age 69 years, in-person, EI).

You tend to deprioritize [online tasks]. It's so easy to get rid of. There's no commitment there. It's whenever you feel like it and I know there's an advantage to

that for some people. It's an incentive to also procrastinate (age 56 years, in-person, FI).

In contrast to the social motivations behind choosing in-person groups, online participants' reasons were primarily logistical: distance, commute time, lack of transportation, or conflicting work schedules. Participants emphasized convenience and scheduling flexibility.

I don't have a car, so it would be difficult for me to get back-and-forth, and I'm trying to minimize the trips I make to the VA. I try to do as many of my appointments on the same day (age 65 years, online, EI).

I work from home and I have to be [home] more than not, so it would've been inconvenient for me to do a classroom-type program. I can't do that. It's much more convenient to do it online at my leisure (age 65 years, online, FI).

Importance of choice—Regardless of their own modality selection, most participants endorsed the importance of being able to choose. They reported that having options made participation possible: many in-person participants had limited computer literacy or access, while many online participants were unable to travel. As one noted, “I think it's an awesome choice, or else I wouldn't have been able to participate” (age 60 years, online, EI). Over half of online participants reported being unable to attend in-person, though several preferred the latter.

I would've absolutely preferred in-person, but to have the choice was important – it's good you were trying to reach people that couldn't otherwise come in-person (age 46 years, online, FI).

Satisfaction with modality choice—Most women were very satisfied with their modality choice. The two online non-completers were least satisfied and felt they would have derived greater benefits by participating in-person. Among in-person participants, the modality aspects most appreciated were social and support opportunities, learning from others, and being present for handouts/materials and class demonstrations. They reported very few dislikes.

Having a group of people to talk to ... That was the good part because even if you fall off you can go in and just say “I had a stressful day, I'm depressed,” and you could talk to people and get through it and get back on track (age 50 years, in-person, FI).

[I like] the fact that you're sitting in class and you exchange information, not just between the instructor, but between the participants as well ... You see what other people have done. Maybe you haven't thought about it so you take it into account (age 56 years, in-person, EI).

Online participants most appreciated the convenience, flexibility, group learning, and camaraderie afforded by this modality. For example:

I liked it online so I didn't have to go anywhere. Didn't have to weigh in in front of somebody else (age 61 years, online, FI).

I like the camaraderie ... If our coach asks questions, mostly everybody replies to it (age 65 years, online, EI).

Some felt the online format was too impersonal or one-size-fits-all, while others reported technical or customer service issues. Several disliked having to log meals or weigh themselves.

They just don't have any modification. It's just mainstream. It's just this way or no way and again that's not gonna work because everybody has different issues. Look, there's a reason people are emotional eaters. It's not sometimes because they like food (age 46 years, online, FI).

I remember being a little discouraged about weighing-in every day. I'm not sure for me that's the best way to do it (age 62 years, online, FI).

Finally, several online participants were quite dissatisfied with *Prevent's* mid-program transition to larger groups, either because of the mixed-gender aspect or significantly increased group size:

The [second] group, I find it a little too big. It's like 1,000 of us. Whereas when I was in the smaller group, I think there were about 20, less than 30. It felt more like a tight-knit group where we could reach out to one another (age 41 years, online, FI).

Modality-specific recommendations—Participants' recommendations for improving the DPP often involved incorporating desirable aspects of the other modality. For example, many online participants wanted greater ability to personalize their experience – e.g., scheduling in-person get-togethers and events, being able to interact individually with other group members, or personalizing their online profiles:

Maybe they could have an event, like a walk-a-thon, or something where everybody can get together and just have a good time (age 64 years, online, EI).

Conversely, in-person participants suggested improving the modality's "accessibility" by offering digital components (e.g., videoconferencing, recordings) or greater scheduling flexibility. Several suggested extending the length of classes to allow for in-depth discussion.

Discussion

The results of this study help fill gaps in the DPP literature on patient experience (Moin et al. 2015). Participation rates were higher in the online DPP groups than in-person groups, supporting recent findings by Moin et al. (2018) and others (Castro Sweet et al. 2018) that report generally high participation in online DPPs. Higher participation rates could be a factor in our online groups' greater mean weight loss, though our study was not powered to examine weight differences between modalities. Participants overall reported positive experiences with their chosen modality and high program satisfaction. In-person participants appreciated the social aspects and group learning, while online participants valued the convenience and flexibility, despite some dissatisfaction stemming from technical problems and the impersonal nature of web-based programs. This echoes earlier findings on

the acceptability of web-based DPP (Moin et al. 2015); participants valued its convenience, accountability, and integration with daily life but were hindered by its less interactive nature, computer literacy issues, and weight-tracking requirement. Studies with Veterans using telehealth programs have documented similar barriers surrounding technological complexity and the need for personal connection or peer support (Gabrielian et al. 2013; Sedlander et al. 2018). However, high online participation in the present study underscores the modality's value despite its drawbacks.

In principle, most participants endorsed the importance of being offered a choice of modality; however, logistical or technological barriers often restricted access to the other option. Modality choice was thus frequently a function of patients' personal circumstances affecting access versus a "preferred choice" between two equally accessible options. While we often think of "choice" as a convenience offered to patients to streamline or incentivize their participation in a given program, our findings reveal a more complex story. In this case, a modality choice allowed us to offer the DPP to a population that would have otherwise been unreachable by a single-format program, whether online-only or in-person-only.

Interviews also revealed that offering women-only DPP groups played a critical role in patient comfort and engagement. Regardless of modality, participants preferred women-only groups, citing increased comfort sharing personal information, camaraderie, and mutual understanding of gender-specific barriers to lifestyle change. Some would have declined enrollment in a mixed-gender group. These findings are consistent with previous research demonstrating women Veterans' preference for women-specific groups, resources and peer support (Ades et al. 2017; Dognin et al. 2017; Martinez et al. 2015; Sedlander et al. 2018), discomfort in predominantly male VA environments (Fontana and Rosenheck 2006; Rossiter and Smith 2014), and the importance of women-focused social networking (SWAN 2018).

Diabetes prevalence continues to rise among U.S. adults (Fang 2018), affecting both the burden and cost of care for health systems and underscoring an urgent need for feasible, effective solutions. Quinones et al.'s (2018) DPP adaptation for individuals with serious mental illness demonstrates the importance of incorporating population-specific needs and barriers into program design. Our tailored DPP effectively addressed known barriers to lifestyle change and intervention engagement in women Veterans with prediabetes, such as potential discomfort in mixed-gender groups, transportation difficulties, rural residence, schedule conflicts, and limited computer literacy or access. Indeed, high patient demand for the DPP resulted in expansion to serve 119 women from the 40 initially planned. Further research could examine additional gender-tailoring strategies; e.g., program content itself could be tailored to address barriers disproportionately affecting women, such as higher caregiving burdens that lead many women to prioritize others' needs above their own (AARP 2015; Kelton Global 2017). Future work could also explore DPP tailoring for men. While prior VA studies have demonstrated DPP effectiveness with a majority-male participant pool (Moin et al. 2017, 2018), men are underrepresented in many weight loss trials with non-Veteran populations (Robertson et al. 2016).

Limitations

The present findings should be interpreted in light of the study's limitations. First, participants were recruited from one large VA health-care system, potentially limiting generalizability to other health-care contexts and populations. Although most DPP translation studies have reported much lower rates of participation than the present study (as low as <10 percent) (Aziz et al. 2015), our small sample size and participation/retention rates could have resulted in participation bias, possibly resulting in inaccurate results and further limiting generalizability. Larger studies are needed to confirm the results.

Second, Omada Health's decision to transition *Prevent* participants to larger, mixed-gender online groups after 16 weeks led to some dissatisfaction with the increased group size and inclusion of men. These larger groups also included non-Veterans. From one perspective, the related qualitative data may, in fact, underscore the importance of gender-tailoring: while some women were ambivalent about transitioning to mixed-gender groups, others disliked it and reported less satisfaction because of it. However, the transition likely had unknown consequences and therefore limits our ability to draw comparisons or tease apart differential effects because the group dynamic was affected in multiple ways. For example, the increased group size made the program feel less personal or supportive, while including civilians may have reduced the DPP's salience for Veterans, who often deal with multiple chronic conditions. Any of these factors, alone or in combination, could have proved off-putting for some.

Technological barriers and difficulty accessing IT support caused additional dissatisfaction among some online enrollees. These challenges with the online modality occurred despite the VA's selection of a company with the known capacity and recognized experience in online health education and coaching. Our experience underscores the importance of assessing any new program for similar challenges, whether VA-developed or externally contracted, to better anticipate and manage potential difficulties for future users. Future studies with women-only online forums should ideally be undertaken in ways that prevent significant mid-group changes. Our experience also highlights technology challenges within VA and encourages early consideration of both user- and system-facing dilemmas and IT support needs.

Conclusions

With a backdrop of rising prediabetes rates and gender disparities in modifiable cardiovascular risk factors, optimal patient engagement in DPPs has been challenging. In the present study, gender-tailoring and modality choice were important factors underlying patient engagement and participation in the DPP and in expanding program reach to women who would otherwise lack access. VA will need to continue pursuing creative solutions for delivering care to women Veterans as well as other vulnerable groups with critical health needs.

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Table 1.

DPP participant characteristics: total sample and interviews.

Participant characteristics	In-person DPP <i>n</i> = 51	Online DPP <i>n</i> = 68	Interviews <i>n</i> = 15 ^a
Mean age in years (SD)	57.2 (12.4)	54.1 (12.5)	55.5 (11.3)
Race/ethnicity <i>n</i> (%)			
Black	29 (57%)	23 (34%)	8 (53%)
White	13 (25%)	33 (49%)	5 (33%)
Asian	1 (2%)	1 (2%)	1 (7%)
Native American	0 (0%)	2 (3%)	0 (0%)
Declined/unknown	8 (16%)	9 (13%)	1 (7%)
Ethnicity			
Hispanic or Latino	9 (18%)	11 (16%)	3 (20%)
Not Hispanic or Latino	41 (80%)	50 (74%)	12 (80%)
Declined/unknown	1 (2%)	7 (10%)	0 (0%)
Mean A1c (%) at baseline (SD)	5.9 (0.2)	5.9 (0.2)	5.9 (0.2)
Mean BMI kg/m ² at baseline (SD)	31.7 (4.8)	32.9 (5.9)	29.5 (3.5)
Mean number of comorbidities (SD)	2.7 (1.9)	2.1 (1.6)	2.5 (1.4)
Patients with >50% service connection	23 (45%)	29 (43%)	6 (40%)
Number of VA clinics represented	4	11	5

^aColumn represents fifteen unique patient participants; seven participants completed both an early implementation interview and a post-implementation interview (*n* = 22 interviews).

Table 2.

Participation rates among DPP enrollees.

	In-person DPP	Online DPP
Participants enrolled	51 (100%)	68 (100%)
1+ sessions attended/completed	22 (43%)	62 (91%)
4+ sessions attended/completed	18 (35%)	54 (79%)
9+ sessions attended/completed	14 (27%)	45 (66%)

Table 3.

Qualitative themes from interviews.

Gender-tailoring		
<ul style="list-style-type: none"> ● Strong preference for women-only groups ● One-third theoretically open to inclusion of men in groups ● Importance of camaraderie, support, and mutual understanding of gender-specific barriers to weight loss ● Importance of shared military background and opportunity to meet other women Veterans ● Discomfort talking openly about the personal body and weight issues around men 		
All participants	In-person	Online
<ul style="list-style-type: none"> ● Importance of being presented with a modality choice ● Only one option truly “available” to most 		
Reasons for modality selection:		
	<ul style="list-style-type: none"> ● Social opportunities ● Support and encouragement ● Learning from others, sharing tips ● Limited computer literacy or access 	<ul style="list-style-type: none"> ● Long distance/commute to in-person groups ● Lack of transportation ● Scheduling conflicts with in-person groups ● Convenience and flexibility
Satisfaction with choice:		
<ul style="list-style-type: none"> ● Most very satisfied with choice 	<ul style="list-style-type: none"> ● Social/support opportunities ● Learning from others ● Handouts ● Class demonstrations ● Few dislikes about modality 	<ul style="list-style-type: none"> ● Convenience and flexibility ● Group learning ● Camaraderie ● Dissatisfaction with: Technical or customer service; program too impersonal; logging meals & weight; switch to larger mixed-gender groups
Modality-specific recommendations:		
<ul style="list-style-type: none"> ● Incorporating desirable aspects of the other modality, such as: 	<ul style="list-style-type: none"> ● Improve accessibility via digital components: <ul style="list-style-type: none"> ● Videoconferencing ● Greater scheduling flexibility ● Longer class length 	<ul style="list-style-type: none"> ● Increase personalizability of experience: <ul style="list-style-type: none"> ● In-person get-togethers/events ● Ability to interact individually with group members ● Customizable profiles