Moderator: Our next speaker is Tannaz Moin, who is going to be talking about weight and participation outcomes in an online diabetes prevention program for Veterans with prediabetes.

Tannaz Moin: Great. Thank you so much. It’s really a pleasure to be here and have an opportunity to tell you a little bit about some of the work I’ve been doing over the last couple of years. So I have no conflicts of interest to disclose and I really did want to start off with my acknowledgement slide. As you can see, it’s barely enough space to include all of the folks who were integral to the success of the project that I’m going to be sharing with you today.

 And in particular, I wanted to highly Laura Damschroder, who’s here with us. As well as Carolyn Richardson, who are the co-PIs of this project and incredible to work with over the last couple of years. So I wanted to start off with a little bit of background. Most of you that know anything about me know that I’m an endocrinologist and my clinical area of interest has been diabetes, as well as prediabetes, for a long time.

 And I think people are surprised that I’m, as an endocrinologist, worried about diabetes. There’s incredible morbidity and mortality associated with the condition. So when we talk about that as an epidemic, folks aren’t surprised. But when it comes to prediabetes, I think there’s still a lot of misunderstanding about the importance of this condition.

 I like to use the iceberg analogy. I have to say that this is something that other experts in the field have used to illustrate the importance of both of these conditions. So at the top, we have diabetes, which as of the CDC statistics that were released just in the last 48 hours, affects about 30 million US adults.

 Tip of the iceberg, dangerous, it’s very evident that you want to avoid the tip of the iceberg. It’s evident to some sort of clear sight. But there’s a lot of danger lurking underneath and it’s the bigger portion of this iceberg. And it represents the 84 million individuals in the US who currently have prediabetes.

 If we do nothing, 15-30% of those individuals will progress onto developing type two diabetes within five years. So not within their lifetime, but within five years. And that’s all pretty depressing statistics, I think. But when we look to the evidence base, there’s a clear direction or clear evidence based interventions that we should be thinking about to lower the relative risk of someone with prediabetes going on to develop diabetes.

 And that comes from the diabetes prevention program or DPP trial that was published in the New England Journal in 2002. So more than 15 years ago now. And what that trial showed is that with intensive lifestyle intervention, we can lower the risk of progression from prediabetes to diabetes by as much as 58% over three years. That’s a whopping effect size and one that should really raise eyeballs and make us aspire to delivering these types of interventions to our patients.

 So there are really important public health implications of this. The problem with the diabetes prevention program as an intensive lifestyle intervention requires 22 in-person sessions. And if I asked you to show up 22 times on Tuesday at noon over the next year, chances are you would make a few of those sessions at best.

 So there’s been growing interest in virtual or online adaptations as a way to increase reach, flexibility, and convenience for participants. But we really don’t know a lot about the effectiveness of these interventions as compared to the traditional in-person programs. So the study I’m going to be telling you about today was a perspective pragmatic. It was a non-randomized VA trial spanning several years.

 The primary aim of this analysis was really for us to assess the effectiveness of the online version of this intervention. And as a secondary aim, we wanted to be able to compare the effectiveness of the online intervention to in-person DPP intervention, as well as to MOVE, which all of you know is our standardized weight loss program within the VA.

 And for this secondary aim, we used data from a concurrent study of comparing the in-person DPP to MOVE that was ongoing at the time that we embarked on this study. So this slide just shows you what the intervention looked like. So individuals that were participating in the online DPP, this looks sort of like a Facebook.

 So there’s a closed virtual group. You can post your picture. You can post a picture of your dog or a flower if you want to be more anonymous. The idea is that you’re working within an online group. You have a coach that you can message or that you can call or the coach can call you or message you. And there are these individual progress bars that don’t have absolute weight numbers, but track progress.

 So there’s some degree of accountability among the group members in terms of achieving their weight loss goals. Which typically are seven percent weight loss, as well as 150 minutes of moderate physical activity a week. And everybody got wireless scales. So they didn’t have to come into the VA for weight assessments. We were collecting that data remotely.

So our participants were all overweight, obese Veterans with prediabetes. We recruited patients from four geographically diverse VA sites. At one site, we were focused primarily on recruiting women Veterans from a women’s clinic. And we identified potentially eligible participants using data that’s already in CPRS, our electronic health record.

Again, we required no in-person visits for someone to be able to participate in this. And it was really an invitation and someone could opt in to this intervention. So we assessed weight change at six and 12 months and again, we used a wireless scale.

If we didn’t have the wireless scale data, then we used data that was in CPRS. As you probably know, most patients have a weight assessment on most clinical encounters at the VA. We did between group and within group comparisons using these linear mixed effects models.

So in terms of our consort flow, we invited 1182 potentially eligible participants. 268 gave informed consent and were medically cleared by their physicians to participate in this intervention. You see here that we had about 60% who either we were unable to reach or they just were not interested in participating and 245 or so that were ineligible.

Among the 268, these are some baseline characteristics. So mean age 60, mean BMI almost 33. I think very typical of the VA population, we did have 31% women and as you remember, that’s higher than we would expect to see. But we had one site focused primarily on recruiting women participants. And we ended up excluding 28 individuals who didn’t have at least two weight assessments for us to be able to really track the follow up.

So in the analyses I’ll be showing you in terms of weight outcomes, there are 242 individuals included. Okay. So this is our 12-month online DPP outcomes. On the Y axis is weight change in kilograms; X access is months from baseline. And here we’ve graphed individuals for whom we were tracking weight based on CPRS data.

So these individuals are folks who primarily didn’t really engage with the online intervention. So they consented, they signed up, but for a variety of reasons, weren’t really using the wireless scale. And as you can see, their weight didn’t really change much. Then we have this group that used the scale, the wireless scale, but in whom we also had weight data based on clinical visits.

And then this last group, on whom we had primarily enough weight assessments using just the wireless scale. So you can see this is the group that seemed to lose the most amount of weight and was primarily the most engaged with the online intervention. So in terms of our participation outcomes, we have data included on all 268.

Four plus and eight plus sessions, you can see that more than half of participants completed at least four or eight sessions. And these cutoffs are important because they reflect the CDC standards for DPP delivery across the US. And we think about actually nine sessions as sort of a threshold affect in terms of weight loss.

But we used eight here to be, and I’ll show you on later slides, to be comparable with MOVE. Because there’s a lot of variation with respect to the number of MOVE sessions. In terms of mean weight change, again, here we’re looking at the subsample of 242 patients.

And you can see four point seven kilograms at four, four point zero kilograms at 12 months, and then the percent weight change of around four and three point seven percent. Our goal for CDC defined standards is at least five percent weight loss. So we were close to that, but not meeting that. And again, we were including individuals who signed up but actually did not at all participate in the intervention.

So quickly, the secondary three arm analysis again was the comparison of the online to in-person DPP, as well as to MOVE. As I mentioned, this in-person DPP and MOVE comparison is part of another ongoing query funded, as well as funded trial by NCP as well as the operational partner. And the recruitment process obviously varied for the online process.

We sent invitation letters. Folks didn’t need to come in for any in-person assessments. Whereas, the in-person versus MOVE trial, folks had actually been referred to MOVE. They were coming into the VA for MOVE orientation, at which time we were systematically assigning them to one of two arms.

So to be able to compare similarly motivated individuals, we thought that we would look at the subsample that at least had some level of engagement in the intervention. So we wanted to look at folks who at least completed one session to say that despite the differences in recruitment, that these folks were motivated enough to at least do one session or online module.

So these are the baseline characteristics. We’re looking at the online DPP, the VA DPP, or the in-person DPP and MOVE. And then the P values and you can see there are differences in the groups. So again, more females in the online DPP group. We had one site who primarily was focused on recruiting women. So that we had expected to see.

In terms of weight, you can see that the online group tended to weigh slightly less than the in-person groups. Sort of similar that the BMI would follow along with that and there were some interesting differences in terms of race and ethnicity. So we had a higher proportion of Hispanic individuals, but lower proportion of African Americans.

So those are the differences there. So this is a similar graph to the one I just showed you. But this is across the three arms. Again, weight here on the Y axis and months from baseline on the X axis. So on the top line here are MOVE participants. There were 64 that attended at least one MOVE session and you can see that they did lose some weight.

And relative to the other groups, much less weight loss. And down here, the dotted line represents the in-person DPP and then this solid line with triangles is the online DPP, which followed a similar trajectory, demonstrating much greater weight loss. So this is again a similar table. Online DPP, in-person DPP, and MOVE, and then a P value that compares the online to the in-person DPP. And then the online versus MOVE.

So if we look at participation rates, again, looking at the CDC defined metrics of four or eight or more sessions. You can see that there are important differences. Online DPP participants had much higher rates of adherence to the intervention than in-person DPP and also compared to MOVE.

In terms of mean weight change, here you can see the values there. And the differences actually were not significantly different between the two DPP programs, online or in-person. But online DPP had much higher weight loss, significantly higher weight loss compared to MOVE.

And again, it follows to the line for the percent weight change. So in terms of our conclusions, we found that over 12 months of follow up, a multi-faceted online DPP intervention resulted in four kilograms of weight loss, about three point seven percent among all participants. And again, we were analyzing data on everybody who did or did not engage with the intervention.

And when we looked at participants who completed at least one session, so that they were motivated enough to at least do that one session. We saw much higher participation rates among those who were participating in the online intervention. And weight change was not significantly different as compared to an in-person DPP, but higher than MOVE.

So implications, our group feels that a multi-faceted online DPP intervention may help us expand reach and outtake of DPP. And really, help us address the ongoing obesity epidemic within the VA. And I think the multi-faceted work here is key in that when we talk about doing online interventions, you could have people just go to a website and read something.

And that definitely is not this intervention. There was a human coach. There was self-monitoring. There was individualized feedback that the participants were receiving from the coach with accountability wireless scales. So this really wasn’t just go to a website and read about healthy lifestyle changes.

So we tried to define this as a high number of potential touches. So even though we think about online interventions as traditionally being less intense in terms of face-to-face contact. There are all these different ways that participants were interacting with either their group members or their coach or the program.

So there is real potential for public health impact and obviously to help us address prediabetes, help us address obesity, and I think within the VA. Where we are challenged with geographic issues, there’s real potential for us to be able to scale and spread this work. So that’s it. Thank you for your attention.

Moderator: We are going to need to hold questions on your presentation until the end.

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