

Abstract

Participation in a Virtual Diabetes Clinic Improves Glycemic Control in Adults with Type 2 Diabetes

Ronald Dixon^{1*}; Howard Zisser^{2*}; Nathan Barleen^{1*}; Jennifer Layne^{1*}; Daniel Moloney^{1*}; Amit Majithia^{3*}; Josh Riff^{1*}

¹Onduo LLC, Newton, MA, United States

²Verily Life Sciences, South San Francisco, CA, United States

³School of Medicine, University of California San Diego, La Jolla, CA, United States

* all authors contributed equally

Corresponding Author:

Ronald Dixon

Onduo LLC

55 Chapel Street

Newton, MA

United States

Phone: 8334466386

Email: ron@onduo.cxom

Abstract

Background: Telemedicine for people with type 2 diabetes (T2D) has the potential to positively impact self-management behaviors and improve health outcomes. The Onduo Virtual Diabetes Clinic (VDC) is a comprehensive telehealth program for people with T2D that combines mobile app technology, remote personalized lifestyle coaching from certified diabetes educators and health coaches, connected devices including blood glucose meters and continuous glucose monitoring systems, and clinical support from board certified endocrinologists.

Objective: To describe the VDC care delivery model and present preliminary data on change in glycemic control in program participants with up to 6 months of follow-up.

Methods: Adults ≥ 18 years of age with T2D and who were members of sponsoring health plans and employers throughout the US were eligible to participate. Those who elected to enroll downloaded the VDC app to their smartphone, provided demographic and clinical information, completed an onboarding survey, and were mailed a self-management kit that included a connected blood glucose meter, test strips and a home glycosylated hemoglobin (HbA_{1c}) testing kit. Participants interacted with their care team primarily through the VDC app, with occasional phone calls, and by synchronous video consultations with endocrinologists, as clinically appropriate. Change in glycemic control in participants who completed a baseline survey from February 2018 through December 31, 2018, with an initial HbA_{1c} measurement within 30 days of enrollment and a follow-up measurement between 90 and 180 days after baseline was analyzed.

Results: Participants (n=740) were (mean \pm SD): 53.8 \pm 8.8 years of age, 62% female, BMI 35.6 \pm 8.5, initial HbA_{1c} 7.7% \pm 1.8, 31.0% were on insulin and 25.9% were on sulfonylureas at baseline, and 30.0% lived in a rural area. HbA_{1c} decreased significantly by 2.3% \pm 1.9, 0.7% \pm 1.0 and 0.2% \pm 0.8 across the baseline categories of $>9.0\%$, 8.0% to 9.0% and 7.0% to $<8.0\%$, respectively (all $P < .001$). Within these categories, HbA_{1c} improved in 91.9%, 77.3% and 63.5% of participants. For the group with an initial HbA_{1c} $>9.0\%$, HbA_{1c} decreased from 10.7% \pm 1.4 to 8.3% \pm 1.5, and when stratified by HbA_{1c} $\geq 8.0\%$ the mean decrease in HbA_{1c} was 1.5%, from 9.5% \pm 1.5 to 8.0% \pm 1.3, with 84.5% of participants demonstrating improvement. Participants with an initial HbA_{1c} $<7.0\%$ who were meeting treatment targets at baseline, HbA_{1c} 6.3% \pm 0.4, continued to maintain this level of glycemic control at follow-up, HbA_{1c} 6.4% \pm 0.6 (ns).

Conclusions: Participation in the VDC was associated with a significant improvement in HbA_{1c} in adults with T2D who were not meeting treatment targets, with the greatest improvement observed in those with an initial HbA_{1c} $>9.0\%$. Importantly, the majority of program participants experienced an improvement in glycemic control. Our findings suggest that the VDC program is an effective approach to support individuals with T2D and their clinicians in diabetes management between office visits.

(*iproc* 2019;5(1):e15258) doi: [10.2196/15258](https://doi.org/10.2196/15258)

KEYWORDS

blood glucose; mobile health (mHealth); telehealth; telemedicine; type 2 diabetes mellitus

Edited by J Brown; this is a non-peer-reviewed article. Submitted 27.06.19; accepted 13.08.19; published 02.10.19.

Please cite as:

Dixon R, Zisser H, Barleen N, Layne J, Moloney D, Majithia A, Riff J

Participation in a Virtual Diabetes Clinic Improves Glycemic Control in Adults with Type 2 Diabetes

iproc 2019;5(1):e15258

URL: <http://www.iproc.org/2019/1/e15258/>

doi: [10.2196/15258](https://doi.org/10.2196/15258)

PMID:

©Ronald Dixon, Howard Zisser, Nathan Barleen, Jennifer Layne, Daniel Moloney, Amit Majithia, Josh Riff. Originally published in Iproceedings (<http://www.iproc.org>), 02.10.2019 This is an open-access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work, first published in Iproceedings, is properly cited. The complete bibliographic information, a link to the original publication on <http://www.iproc.org/>, as well as this copyright and license information must be included.