## Users managing Diabetes with Large-scale Digital Therapeutics Platform Experience a Change in Blood Glucose and Engagement Over Two Years.



Authors: Inbar Breuer Asher, Emily Gibbons, Amir Gurewitz, Omar Manejwala M.D, Yifat Fundoiano-Hershcovitz Ph.D

DarioHealth Corp

### Description

One of the goals of a digital diabetes management platform is to improve patients' selfmanagement and control of their condition<sup>1,2</sup>. Digital engagement can play a central role in supporting needed behavioral changes to manage diabetes<sup>3,4</sup>.

#### Research question

This study investigates whether there is a change in digital platform engagement over two years on large-scale user data. This study also examines the change in monthly average blood glucose (BG) and in the ratio of high-range readings among high-risk users of a digital health platform over two years.

#### Method

A retrospective real-world data study was performed on the Dario<sup>TM</sup> database. The current sample is based on active users since 2019 with at least two months measurements along two years. Engagement was assessed by BG measurements. Clinical outcomes were average BG and high readings (>180mg/dL) ratios. Linear mixed effects models investigated changes in engagement and clinical outcomes.

#### Results

- A population of 119,482 platform users was included, Age: 53 ± 15; Gender: 51% women.
- High-risk subgroup included 31,562 users with first month (baseline) average BG>180 mg/dL.
- Total users' engagement increased significantly by 29% (14.3 to 18.5) over two years (p<0.001).
- High readings ratio (>180mg/dL) in high-risk subgroup decreased significantly by 38% (38.8% vs.63.1%) over two years (p<0.001).
- The monthly average BG of the high-risk subgroup was reduced significantly by 16% (218.1mg/dL to 183.4mg/dL) over two years (p<0.001). A negative interaction effect was found with monthly engagements and the monthly average BG, as users with increased engagements (+1 SD) demonstrated stronger reductions in monthly average BG.

# Reduction in monthly average blood glucose and high readings ratio in high-risk users Month

Figure 1: Changes in monthly average blood glucose and high readings ratio in high-risk users over 24 months of Dario platform usage

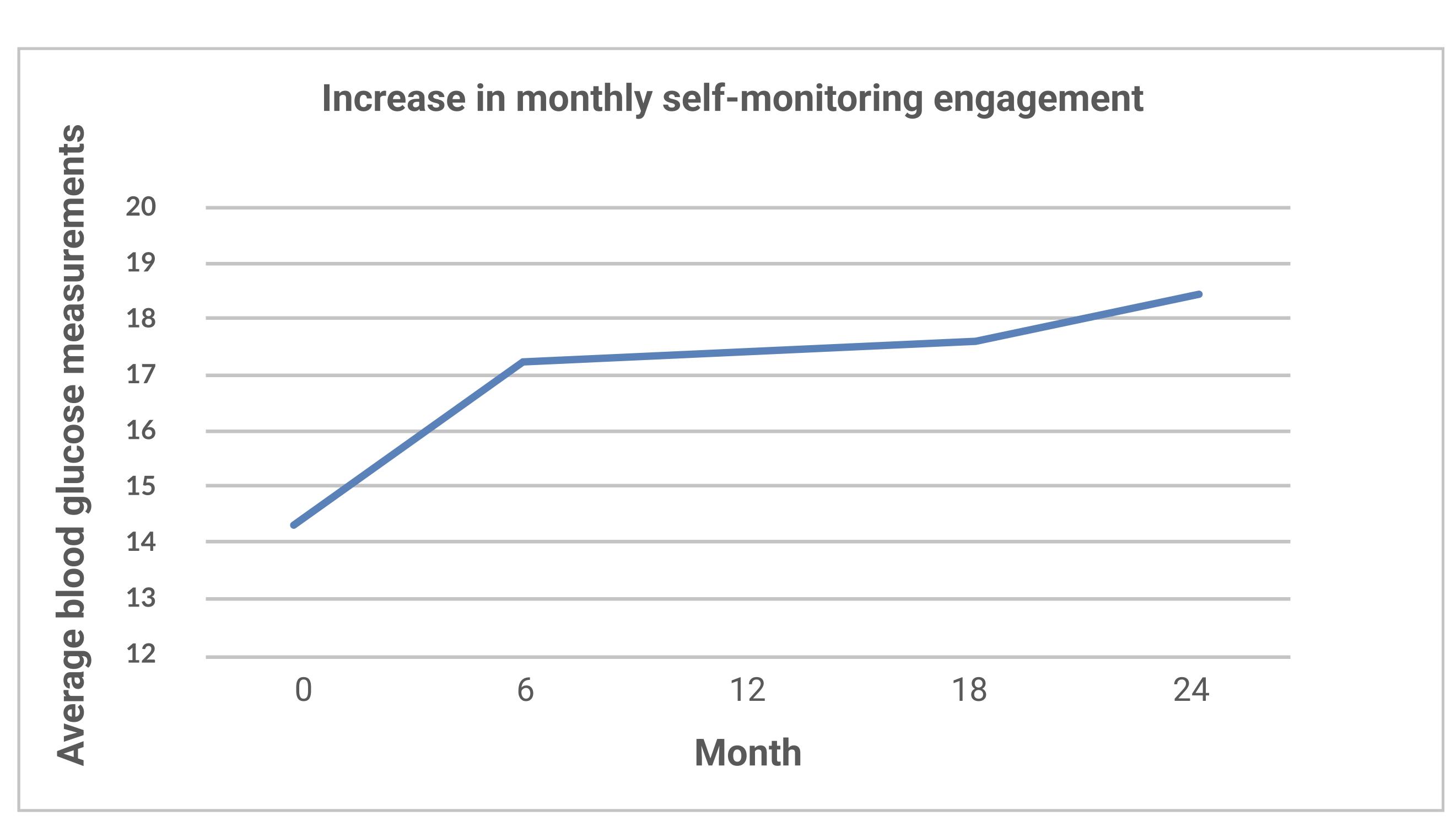


Figure 2: Changes in self-monitoring engagement on Dario platform over 24 months

#### Discussion

A large real-world data for Dario users' group was examined across two years to investigate changes in blood glucose and platform engagement. In this present study, the high-risk population showed significant improvements in high reading ratio (>180mg/dL) and in the monthly average BG over the two years. Moreover, the impact of engagement on the monthly average BG was demonstrated, as users who were more engaged showed significantly stronger reductions. These findings indicate how digital therapeutic platforms may help to improve blood glucose management. These results are supported by previous studies that demonstrated the association between digital engagement and clinical outcomes in chronic condition management<sup>4,5</sup>. This study emphasizes the high capability of a digital health platform to support diabetes management, and the potential benefit to promote behavioral change in large scale population.

#### Conclusion

Digital therapeutic platforms have the potential to provide an effective intervention due to their low-cost, interactive features and dynamic health promotion<sup>6</sup>. The present study demonstrates the benefits of engagement with a digital therapeutic platform for diabetes management in high-risk patients, presenting an improvement in glycemic outcomes which is sustained for a significant period.

#### References:

1. Kumar S, Moseson H, Uppal J, Juusola JL. A Diabetes Mobile App With In-App Coaching From a Certified Diabetes Educator Reduces A1C for Individuals With Type 2 Diabetes. Diabetes Educ. 2018;44(3):226-236. doi:10.1177/0145721718765650

2. Dack C, Ross J, Stevenson F, et al. A digital self-management intervention for adults with type 2 diabetes: Combining theory, data and participatory design to develop HeLP-Diabetes. Internet Interv. 2019;17:100241. doi:10.1016/j.invent.2019.100241

3. Kaufman N. Digital Therapeutics: Leading the Way to Improved Outcomes for People With Diabetes. Diabetes Spectr. 2019;32(4):301-303. doi:10.2337/ ds19-0012

4. Fundoiano-Hershcovitz Y, Hirsch A, Dar S, Feniger E, Goldstein P. Role of Digital Engagement in Diabetes Care Beyond Measurement: Retrospective Cohort Study. JMIR Diabetes. 2021;6(1):e24030. doi:10.2196/24030

5. Lin PH, Grambow S, Intille S, et al. The Association Between Engagement and Weight Loss Through Personal Coaching and Cell Phone Interventions in Young Adults: Randomized Controlled Trial. JMIR MHealth UHealth. 2018;6(10):e10471. doi:10.2196/10471

6. Hou C, Carter B, Hewitt J, Francisa T, Mayor S. Do 2016;39(11):2089-2095. doi:10.2337/dc16-0346