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IMPACT OF A DIGITAL THERAPEUTIC PLATFORM ON WEIGHT LOSS AND DIABETES SELF-MANAGEMENT

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Introduction

Diabetes and obesity have increased incidence and morbidity and are recognized as epidemic by the World Health Organization[1,2]. To compound matters, evidence suggests that weight loss is more difficult in persons with diabetes[3,4]. Clinical guidelines emphasize the importance of weight loss to avoid complications such as cardiovascular disease[2]. Digital therapeutics are designed to help users develop active roles in managing health. Dario, a digital therapeutic platform, may assist patient self-monitoring to optimize outcomes in obesity and diabetes.

Method

A retrospective study was performed on 715 Dario active members who started with a baseline BMI of ≥30 kg/m² (51% male; 48% female; 80% with type 2 diabetes) and who recorded weight measurements for at least 12 months. Weight measurements and blood glucose readings were observed over 12 months.

Results

- The total population of 715 users who participated in the study improved their weight level on average ($p<0.05$).
- Nearly two-thirds of the population improved their weight, with an average reduction of 7.4% ($p<0.05$) and an average reduction in BMI of 2.8 kg/m² (Table 1, Figure 1).
- Over 30 percent achieved weight loss of 5% or greater over 12 months.
- A subset of 237 engaged users who started with BMI of ≥35 kg/m² achieved weight loss of 5% over 12 months ($p<0.05$).
- The subgroup of 108 users that started at high-risk blood glucose levels (average blood glucose >180 mg/dL) reduced their weight by 4.9%, average blood glucose by 16.1% and high readings ratio by 38% over 12 months ($p<0.05$) (Table 1, Figure 2).

Table 1: Changes in weight values over 12 months in Dario users

Population	Baseline weight (Kg)	12 months weight (Kg)	Significance
BMI≥30 kg/m²; N=466*	109.2	101.1	p≤0.05
BMI≥35 kg/m²; N=237	117.2	111.3	p≤0.05
BMI≥30 kg/m²; High risk>180 mg/dL N=108	109.3	103.9	p≤0.05

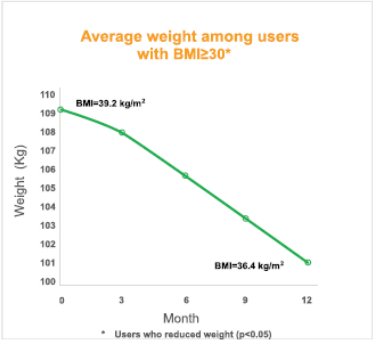

Figure 1: Average weight and BMI within 12 months.

Figure 2: Changes in weight and blood glucose levels over 12 months in high-risk users.

Discussion

Obesity and diabetes are intimately linked. Weight reduction with intensive lifestyle intervention has been shown to reduce the incidence of diabetes by 58% [5]. For individuals with diabetes, studies have shown that a loss of 5–10% of body weight can improve fitness, reduce HbA1c levels, improve cardiovascular disease risk factors, and decrease use of diabetes, hypertension, and lipid-lowering medications [6]. Greater clinical improvements are observed with greater weight loss. Additionally, compared to people without diabetes, it is more difficult for persons with diabetes to lose weight [3]. Metabolic, psychological, and behavioral factors affect the ability of people with diabetes to lose weight. Sustained weight loss can be even more difficult to achieve for overweight and obese people with diabetes. It has been shown in previous research that for people without diabetes, participating in weight loss interventions, the mean weight loss at 12 months was 4.5–7.5 kg (5–8%), whereas in people with diabetes, mean weight loss was 1.9–4.8 kg (3.2%) [6]. Weight loss of >5% appears necessary for beneficial effects on A1C, lipids, and blood pressure [5]. Achieving this level of weight loss is difficult for many reasons- it often requires intense interventions, including energy restriction, regular physical activity, and for some individuals, health professional interactions. Due to the nature of metabolic diseases such as diabetes and obesity, several attempts have been made to apply elements of digital health for effective treatment and management [7]. Beyond the simple recording or delivery of information, digital health platform for multiple chronic conditions management, provides a range of various content suitable for the a user's clinical condition and, may improve self-management efficiency and clinical course through personalized interventions.

Conclusion

This observational study demonstrates the potential for digital platforms to durably improve diabetes and weight self-management among users with BMI of ≥30 kg/m².

Sources:

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