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Effect of a Digital Diabetes Solution on All-Cause Healthcare Resource Utilization Charges for Patients With Type 2 **Diabetes: A Retrospective Cohort Study** Laura Wilson,¹ Daniel Malone,² Praveen Potukuchi,¹ Nita Thingalaya,¹ Keni C.S. Lee,³ Alison Edwards,⁴ Xinyan Yu,⁴ Felix Lee,⁵ Adee Kennedy,¹ Edward Han-Burgess,⁵ Diana Brixner²

INTRODUCTION

- Diabetes, a chronic condition that requires continuous management, has been estimated to affect 37.3 million individuals in the United States.¹
- Direct annual medical costs in the United States have been estimated to be \$237 billion.²
- Digital healthcare technology that provides personalized intervention can improve diabetes care management and has the potential to reduce medical costs.^{3,4}
- Dario Diabetes Solution (DDS) is a digital health solution with a smartphone application for diabetes management.
- DDS combines a blood glucose meter and a mobile application, allowing patients to track blood glucose levels in real-time.

- DDS automatically logs blood glucose measurements and allows the user to log meals, carbohydrate consumption, insulin intake, physical activity, and other parameters.

OBJECTIVE

• To compare all-cause healthcare resource utilization (HCRU; inpatient hospitalizations + emergency room visits) charges for DDS users vs matched non-users

METHODS

• In this retrospective cohort study, the patient selection window was January 2017 to April 2021 **(Figure 1)**.



- Inclusion criteria

- baseline period

- was determined.

EXACT MATCH



4.54%

0 10 20 30 40 50 60 70 80

Other

Medicaid* 4.54%

Cash 0.04%



 $-0 \rightarrow$



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-16 -14 -12 -10 -8 -6 -4 -2 -16 -14 -12 -10 -8 -6 -4 -2

DDS, Dario Diabetes Solution; LPS, logit of propensity score; PSM, propensity score matching.



- Although not statistically significant, DDS users were 9.1% less likely to incur allcause HCRU charges compared with non-users (OR, 0.91; P=0.07).
- In the group that incurred charges, DDS users had 26.0% lower all-cause HCRU charges vs non-users, which was statistically significant (Figure 5).
- The percentages of patients who incurred T2DM-related HCRU charges were low (DDS users, 3.1%; DDS non-users, 3.0%).





DDS, Dario Diabetes Solution; HCRU, healthcare resource utilization; PPPY, per patient p

- DDS users were more likely to incur all-cause OV charges compare non-users (OR, 1.15; *P*=0.04).
- In the group that incurred charges, DDS users had significantly lower all-cause OV charges vs non-users at 1 year (19.4% difference; Figure 6).

Figure 6: Follow-up charges in patients incurring >\$0 al office visit charges at 1 year



*Adjusted PPPY savings.

DDS, Dario Diabetes Solution; PPPY, per patient per year

 DDS users acheived cost savings for both all-cause HCRU and OV compared with non-users (Table 1).

Table 1. Estimated paid costs after applying cost-to-charge ratio for follow-up charges in patients incurring >\$0 all-cause HCRU charges at 1 year*

	DDS Users n=699	DDS Non-Users n=2200	
All-cause HCRU	\$12,843	\$17,356	
All-cause OV	\$2345	\$2909	

*Paid costs were estimated by applying derived cost-to-charge ratios to total charges on medical claims, then calculating the ratio of total estimated cost over total charged cost across the study period for an aggregated cost-to-charge ratio (HCRU, 0.36; OV, 0.32).

DDS, Dario Diabetes Solution; HCRU, healthcare resource utilization; OV, office visit; PPPY, per patient per year.

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234	
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Cost Savings

\$4513 \$564

CONCLUSIONS

 In this retrospective study, patients with T2DM who utilized DDS incurred significantly lower all-cause HCRU and OV charges compared with non-users.

- In the group that incurred charges, DDS users had 26% lower all-cause HCRU charges compared with non-users (P<0.0001) and adjusted savings of \$12,552.
- In the group that incurred charges, DDS users had 19% lower all-cause OV charges compared with non-users (*P*<0.0001) and adjusted savings of \$1790.
- Paid costs were estimated by applying derived cost-tocharge ratios to total charges on medical claims, then calculating the ratio of total estimated cost over total charges across the study period.
- DDS users realized a total cost savings of \$4513 PPPY for all-cause HCRU costs and \$564 PPPY for all-cause office visit costs compared with non-users.
- The lower charges and estimated costs in the DDS group offset the cost of the DDS application and provide incremental savings.

References

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Disclosures

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