

Barriers to Continuous Glucose Monitor Use in Adolescents with Type 1 Diabetes

Eric Tsay, MD¹, Dennis Chia, MD¹, Rebecca Hicks, MD², Tannaz Moin, MD, MBA, MSHS^{1,3}

¹ David Geffen School of Medicine at UCLA, ² Endocrine and Diabetes Center, Miller Children's & Women's Hospital

³ HSR&D Center for the Study of Healthcare Innovation, Implementation & Policy, VA Greater Los Angeles Healthcare System

Background

- Continuous glucose monitors (CGMs) are devices patients can use to monitor their glucose level throughout the day and night
- CGMs have been proven to improve glycemic control¹, however this technology remains poorly utilized by adolescents²
- CGMs barriers have been described in adults and youth in predominantly white and higher socioeconomic communities^{3,4}

Objectives

- To characterize the barriers and facilitators of CGM use among UCLA adolescents with type 1 diabetes and examine differences among patients with varying levels of CGM use

Aims

- **Aim 1:** To assess patient perspectives of diabetes technology for diabetes care and barriers and facilitators of CGM use
- **Aim 2:** To examine differences in demographic and psychologic factors among current CGM users with good or poor adherence and CGM non-users

Methods

- We conducted a cross-sectional survey of UCLA pediatric endocrinology clinic patients with type 1 diabetes
- Inclusion criteria included age 12-21 years and known diagnosis of type 1 diabetes for at least 6 months
- We used electronic medical record (EMR) data to identify eligible patients with upcoming UCLA appointments
- Eligible participants received an invitation from their usual care provider. The survey could be completed in-person or online via the UCLA Qualtrics platform.
- Survey items included demographic information, attitudes regarding diabetes care and diabetes technology, and barriers to CGM use
- All participants (and parents) provided consent and received a \$25 incentive

Results

- Between Feb-May 2021, we screened a total of 75 patients with upcoming appointments in the UCLA pediatric endocrine clinics
- Among the 43 patients reached, 30 patients provided consent and 26 (60%) completed the survey

Table 1. Participant Characteristics

Characteristic	n (%) or mean
Mean age (years)	15.2 ± 2.1
Sex	
Male	13 (50%)
Female	13 (50%)
Race	
White	16 (62%)
Black or African American	4 (15%)
Other/Multiracial	4 (15%)
Declined to state	2 (8%)
Hispanic, Latino, or Spanish origin	4 (15%)
Parent with at least a college degree	11 (42%)
Insurance	
Public	13 (50%)
Private	13 (50%)
Diabetes duration (years)	6.3 ± 3.9
Mean HbA1c (%)	8.9 ± 1.9

Table 2. Perceptions and Diabetes Control by CGM User Type

Score	Consistent CGM users n = 14 (53.8%)	Intermittent CGM users n = 5 (19.2%)	CGM non-users n = 7 (26.9%)	P
Perceived CGM benefit 1-5, higher is more perceived CGM benefit	4.59 ± 0.47	4.73 ± 0.27	4.25 ± 0.29	0.10
Perceived CGM burdens 1-5, higher is more perceived CGM barriers	1.92 ± 0.40	2.00 ± 0.25	2.02 ± 0.64	0.88
Diabetes technology attitude 5-25, higher is more positive attitude	22.50 ± 2.35	23.80 ± 1.70	19.14 ± 3.72	0.13
Diabetes self-efficacy 1-5, higher is more self-efficacy	3.85 ± 0.70	4.36 ± 0.67	3.20 ± 0.63	0.02*
Perceived diabetes burdens 0-100, higher is more diabetes burden	54.91 ± 23.08	46.00 ± 9.12	55.71 ± 25.29	0.70
Diabetes quality of life 0-100, higher is more quality of life	63.37 ± 15.42	56.67 ± 8.22	55.09 ± 16.22	0.42
PHQ-8 0-24 score	4.21 ± 4.46	3.40 ± 2.30	8.29 ± 9.16	0.26
HbA1c	8.1 ± 0.7	8.6 ± 2.2	10.9 ± 2.6	0.002*

- Response rates varied based on the type of visit; patients with in-person visits were much more likely to complete the survey than patients with video visits (84 vs. 28%)
- Consistent CGM users had lower perceived CGM burdens and higher quality of life as compared to intermittent CGM users and CGM non-users
- Intermittent CGM users had higher perceived CGM benefits, more positive attitude towards diabetes technology, and higher diabetes self-efficacy compared to consistent CGM users and CGM non-users
- CGM non-users had the lowest perceived CGM benefits, positive attitude towards diabetes technology, diabetes self-efficacy, and diabetes quality of life; conversely, CGM non-users had the highest perceived CGM burdens, perceived diabetes burden, PHQ-8 score, and HbA1c

Conclusions

- Our study found that a more positive view towards CGMs and diabetes technology and increased self-efficacy was associated with improved CGM adoption and more consistent use
- CGM users with good or poor adherence had lower HbA1c, higher quality of life, and decreased diabetes burden compared to non-users

Implications/Next Steps:

- Findings from this study can help inform interventions to improve CGM use in adolescents with type 1 diabetes
- UCLA and other health systems can partner on initiatives to help increase CGM use among adolescents with type 1 diabetes

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