Utilization of Time in Range in Real World Varies by Type of Diabetes

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Background and Aims

Previous studies have shown a negative correlation between Time in Range (TIR) and risk of microvascular complications [1]. The American Diabetes Association's Standards of Care recommends that healthcare providers use TIR to evaluate glucose management with a 14-day CGM assessment [2]. Despite the benefits of the metric, the level of TIR use among people with diabetes is unknown. **The present study aimed to assess how people with diabetes use TIR when setting health goals and monitoring diabetes data.**

Methods

The sample included 958 adults with diabetes and 44 caregivers of children and/or adults with diabetes from the dQ&A U.S. Patient Panel. Respondents were asked a series of questions related to personal diabetes-related goals and treatment metrics they review on their own and during visits with HCPs. Respondents were categorized by their diabetes type and treatment regimen; T1 (n=201), T2 on MDI/pump (n=195), T2 on basal insulin only (n=195), T2 on SGLT-2/GLP-1 (n=202), T2 on oral meds only (n=103), and T2 no meds (n=106). Responses were collected via an online survey in October 2021. All respondents were compensated for completing the survey ($10 USD). Data was collected using Qualtrics Survey Software, prepared in IBM SPSS, and analyzed in MarketSight. Health and demographic information were collected and are shown below in Table 1.

	Total (n=1,002)	T1 (n=201)	T2 (n=801)
Age in years, mean (SD)	**61.9 (14.0)**	51.0 (19.5)	64.6 (10.7)
Gender			
- Female	**38%**	64%	38%
- Male	**62%**	36%	62%
Household income			
- <$50,000	**37%**	29%	38%
- $50,000-$100,000	**26%**	27%	26%
- >$100,000	**15%**	24%	13%
- Prefer not to answer	**22%**	19%	22%
Race/Ethnicity			
- White*	**82%**	84%	82%
- Black or African American*	**7%**	5%	8%
- Native American*	**0%**	1%	0%
- Asian or Pacific Islander*	**2%**	1%	2%
- Hispanic	**4%**	5%	4%
- Multiracial	**3%**	1%	3%
- Prefer not to answer	**1%**	2%	1%
*limited to those selecting only one ethnicity			
CGM usage			
- CGM user	**32%**	56%	26%
- CGM non-user	**68%**	44%	74%

Table 1. Baseline demographics of respondents, total and by diabetes type.

Results

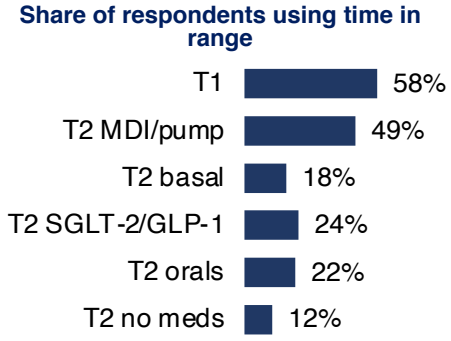

FIGURE 1. Patients' use of TIR by Diabetes Type. Participants were asked a series of questions related to their personal diabetes goals, goals that they set with their healthcare provider, treatment metrics used in their diabetes management, and awareness of TIR. Responses were classified as TIR user or TIR non-user based on a combination of TIR awareness and incorporation into diabetes goals or and/or treatment metrics.

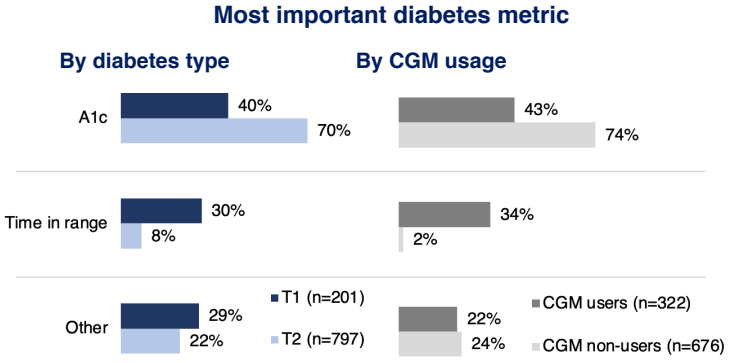

FIGURE 2. Patients' Most Important Diabetes Metric by Diabetes Type and CGM Usage. Participants were asked "When thinking about your diabetes, what is the most important piece of information for you personally when it comes to understanding how you are doing?" Responses were classified as A1c, Time in range, or Other based on their response.

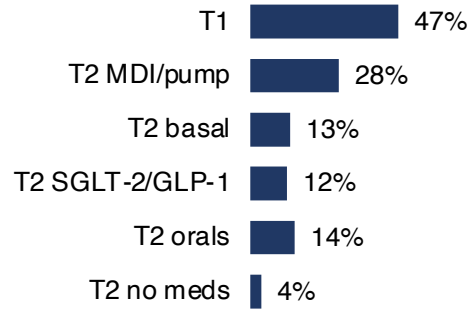

FIGURE 3. Distribution of Patients who had Increasing TIR as a Top 3 Diabetes Goal by Diabetes Type. Participants who have specific, personal goals related to their diabetes were asked, "Please select the top 3 goals you typically focus on to manage diabetes." A higher share of those with Type 1 or Type 2 on MDI/pump indicated increasing TIR as one their top 3 diabetes goals compared to other patient groups (Z-test, p<0.05).

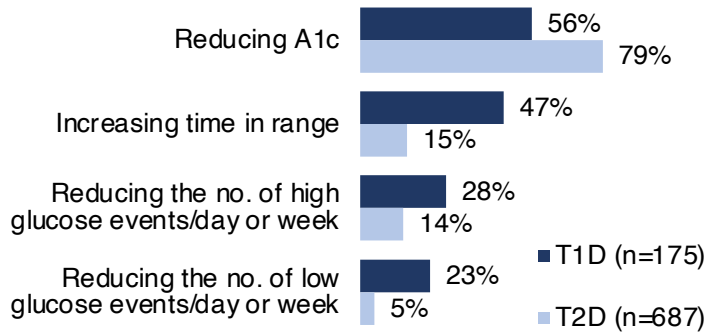

FIGURE 4. Patients' Top 3 Diabetes Goals by Diabetes Type. Participants who have specific, personal goals related to their diabetes were asked, "Please select the top 3 goals you typically focus on to manage diabetes."

Conclusions

People with T2 and CGM non-users are less likely to use TIR and identify it as the most important diabetes metric. Aside from people with T1D (58%) and T2s on MDI/pump therapy (49%), those on less intensive therapy for T2D are far less likely to use TIR (<25% depending on the treatment group). TIR was more likely to be identified as the most important diabetes metric by respondents who used CGMs (34%) and respondents with T1D (30%) compared to CGM non-users (2%) and respondents with T2 (8%) (Z-test, p<0.05).

People with T1 are more likely to view increasing TIR as an important personal goal. For the 86% of respondents who set personal diabetes health goals, consideration of TIR among one's top three goals was higher for those with T1 (47%) than those with T2 (15%) (Z-test, p<0.05). The share of participants who identified 'increasing TIR' as one of their top 3 diabetes goals was highest among T1s (47%) and T2s on MDI/pump therapy (28%) than T2s on less intensive therapies (<15% depending on treatment type).

Implications

Greater access to CGMs may enable more people with diabetes to use TIR in their daily disease management. While A1C remains a leading diabetes metric, TIR can provide real-time, actionable health data to people with diabetes. Because CGM users are more likely to use TIR, increasing access to CGM devices may improve TIR awareness among people with diabetes, especially in T2 populations.

Future research on TIR should focus on the metric's association to macrovascular health complications and psychosocial outcomes.

Sponsored by the Time in Range Coalition

References

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2. American Diabetes Association Professional Practice Committee; 6. Glycemic Targets: Standards of Medical Care in Diabetes—2022. Diabetes Care 1 January 2022; 45 (Supplement_1): S83–S96. https://doi.org/10.2337/dc22-S006.