



Patient Perspectives on Satisfaction and Trust Related to Insulin Delivery Devices

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Introduction

Diabetes Care necessitates being responsive to individual's specific needs and preferences. Today insulin delivery devices (IDDs) offer options for people with diabetes (PWD) and their healthcare providers (HCPs) to individualize and improve diabetes management. Satisfaction and trust related to IDDs are critical factors in facilitating device adoption, treatment adherence, and diabetes outcomes.

One such IDD is the t:slim X2™ insulin pump with Basal-IQ® predictive low-glucose suspend technology that utilizes glucose values from CGM to predict and help prevent hypoglycemia. Basal-IQ technology has demonstrated significant reduction in hypoglycemia across different age groups of people with type 1 diabetes (T1D).¹

The American Diabetes Association emphasizes aligning therapy recommendations with patient needs and preferences to maximize patient acceptance and satisfaction. These factors contribute to reducing the burden of self-management and improving therapy adherence.

Aim

To assess satisfaction and trust related to different IDDs in people with T1D before and after starting Basal-IQ technology.

Method

Participants included people with T1D who either requested an update to Basal-IQ technology on their existing t:slim X2 pump or had purchased a new t:slim X2 pump with Basal-IQ technology.

In all, 985 participants completed an online baseline survey including questions about their IDD (prior to Basal-IQ technology). This survey was repeated after 6 months (Post-Assessment) to assess participants' experience with Basal-IQ technology. Participants received a \$20 gift card at Post-Assessment.

Repeated measures analysis of variance (ANOVA) was used to examine quantitative differences in satisfaction (IDD-Sat) and trust (IDD-Tru) from pre-Basal-IQ technology use (Baseline) to post-Basal-IQ technology use (Post-Assessment). Within-subjects factor was Timepoint (Baseline vs Post-Assessment) and between-subjects factor was Previous IDD.

Participants elaborated on their experiences with their IDD in open-ended items on satisfaction and trust with their devices. These qualitative self-reports were analyzed by two coauthors (Singh H, Sanchez H) using the content analysis approach. Dominant themes were identified around participants' experiences with their IDDs at Baseline and Post-Assessment.

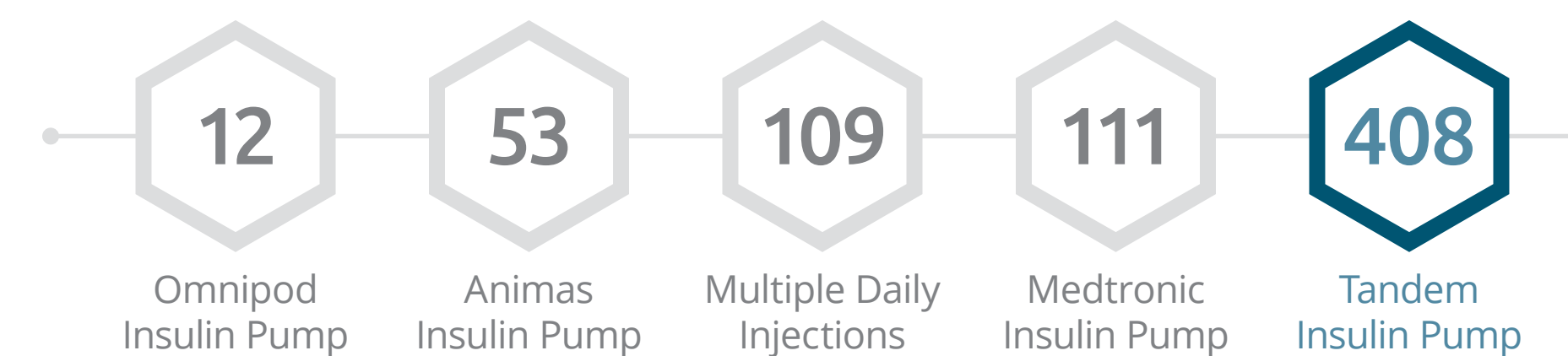
Results

In all, 693 participants completed surveys at Baseline and Post-Assessment. Of these, 18% were under 18 years old, 97% had T1D, the mean age was 37.42 years (SD=16.89), 55% were female, and 90% reported using a CGM at Baseline. Figure 1 presents the Baseline insulin delivery device use in study participants.

Quantitative

Overall, there was a significant increase in both satisfaction and trust related to insulin delivery device after 6 months of Basal-IQ technology use ($p < 0.001$). There was a significant interaction between Timepoint and Previous IDD in that the extent to which IDD-Sat and IDD-Tru increased at Post-Assessment depended on Previous IDD (Table 1, Figure 2).

▼ **FIGURE 1: Baseline Insulin Delivery Device Use.** Sample size from 693 participants.



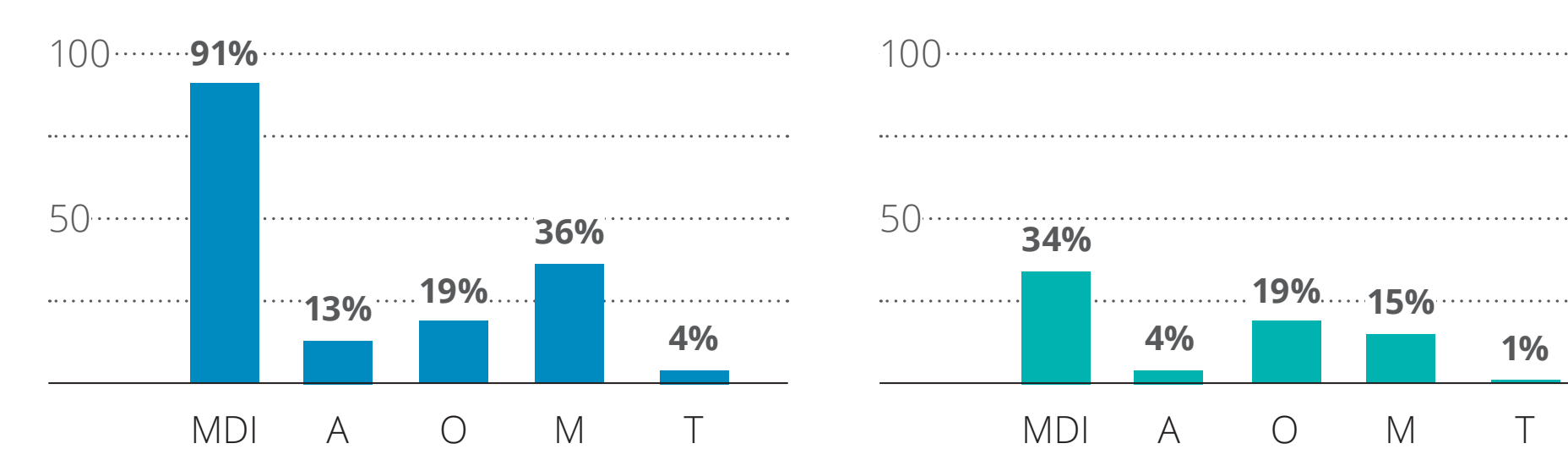
- Although a significant increase in IDD-Sat was seen across participants (irrespective of Previous IDD type) at Post-Assessment, those on multiple daily injections (MDIs) reported the largest increase in satisfaction (4.8 to 9.2, 91% increase), followed by previous Medtronic users (6.3 to 8.6, 36% increase).

▼ **TABLE 1: Changes in Satisfaction and Trust.** Related to insulin delivery devices at Baseline and 6 months Post-Assessment with Basal-IQ technology.

IDD Satisfaction	Baseline Mean (SD)	Post-Assess. Mean (SD)	Difference Mean (%)	p value
MDI	4.81 (2.38)	9.20 (1.21)	4.39 (91%)	<0.001
Animas (A)	7.96 (2.04)	8.98 (1.31)	1.02 (13%)	0.002
Omnipod (O)	6.92 (2.07)	8.25 (2.42)	1.33 (19%)	<0.001
Medtronic (M)	6.31 (2.51)	8.58 (1.85)	2.27 (36%)	<0.001
Tandem (T)	8.63 (1.83)	9.00 (1.47)	0.37 (4%)	0.049
Overall	7.58 (2.53)	8.95 (1.52)	1.37 (18%)	<0.001

IDD Trust	Baseline Mean (SD)	Post-Assess. Mean (SD)	Difference Mean (%)	p value
MDI	6.96 (2.43)	9.30 (1.03)	2.34 (34%)	<0.001
Animas (A)	8.45 (2.04)	8.79 (1.54)	0.34 (4%)	0.228
Omnipod (O)	7.17 (2.25)	8.50 (1.38)	1.33 (19%)	0.024
Medtronic (M)	7.8 (2.38)	8.95 (1.39)	1.15 (15%)	<0.001
Tandem (T)	9.06 (1.41)	9.18 (1.24)	0.12 (1%)	0.209
Overall	8.45 (2.01)	9.12 (1.27)	0.67 (8%)	<0.001

▼ **FIGURE 2: Improvements in Satisfaction and Trust.** Percentage increase in insulin delivery device satisfaction (■) and trust (■) between Baseline and Post-Assessment.



- Previous MDI, Omnipod, and Medtronic users all showed a significant increase in IDD-Tru at Post-Assessment. Animas and Tandem Diabetes Care® pump users reported high trust with their devices at Baseline and didn't show any significant improvements at Post-Assessment, possibly due to a ceiling effect.

Qualitative

Barriers to IDD-Sat and IDD-Tru: Primary barriers included poor integration with CGM, insulin leakage and absorption issues, and inconvenience around using the insulin delivery device.

- "I don't really enjoy having to stick myself in the stomach four or five times a day...it sucked, but I dealt with it." (MDI user)

Facilitators to IDD-Sat and IDD-Tru: Ease of use, reliability of the insulin delivery device, and improved diabetes outcomes (glycemic and psychological) were reported as primary factors affecting IDD-Sat and IDD-Tru after using Basal-IQ technology.

- "I would recommend it to anybody that is currently doing MDI...Simple to wear all day/night."
- "Basal-IQ technology has helped me prevent lows frequently at work."

Conclusions

This study demonstrated notable improvements in IDD-related satisfaction and trust after 6 months of Basal-IQ technology use.

An understanding of factors affecting IDD-Sat and IDD-Tru can assist HCPs and PWDs to have an informed dialogue regarding viable IDD options and help establish realistic expectations.

KEY MESSAGE

Patients' experiences with their current insulin delivery device contribute to their perceptions of barriers to and facilitators for optimizing diabetes management.

References: 1. Forlenza GP, et al. *Diabetes Care*. 2018;41(10):2155-2161. 2. Editorial. *Lancet Diabetes Endocrinol*. 2019;7(9):657. 3. Subramanian S, et al. *Diabetes Spectr*. 2014;27(2):87-91. 4. Fleming GA, et al. *Diabetes Care*. 2020;43(1):250-260. 5. Tanenbaum ML, et al. *J Diabetes Sci Technol*. 2017;11(3):484-492. 6. Arafat Y, et al. The Use of Measurements ... Present Challenges and Future Solutions [Internet]. 2018. 7. Liberman A, et al. *Diabetes Technol Ther*. 2016;18(Suppl 1):S101-S111.