PCR136

Patient and Healthcare Professional Experiences of Suboptimal Insulin Dosing

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BACKGROUND

- Inadequate HbA1c control is associated with the development of diabetes-related complications and associated with higher health care costs[1]
- Insulin non-adherence is widely recognised as having a negative impact on glycaemic control[2]
- The extent of suboptimal insulin dosing, and key triggers for this, are not clear from a person with diabetes (PwD) or healthcare professional (HCP) perspective

[1] Ali SN, et al. *Adv Ther* 2020;37:869-886.
[2] Robinson S, et al. *Diabetes Technol Ther* 2021;23(12):844-856.

OBJECTIVE

- From the perspective of PwD and HCPs:
  - To understand the extent of suboptimal insulin dosing
  - To examine reported barriers to optimal insulin dosing

STUDY DESIGN

- Multi-national, cross-sectional online survey
- HCPs and PwD were surveyed to understand the extent of suboptimal dosing and its behavioural barriers and triggers
  - Data collected September 2021 to January 2022
  - Central ethics board approved study
- Participants from UK, Germany (DE), USA, Spain (**Table 1**)
- Definitions of missed and mis-timed dose provided to survey participants:
  - Missed refers to not taking a dose you know you should have taken, intentionally or unintentionally
  - Mis-timed refers to any insulin doses you may have taken at the wrong time (e.g., not within 10 to 15 minutes before a meal for BOLUS/mealtime insulin) or not at your usual time (for BASAL insulin)

Table 1. Summary of participants by type and location

Participants	Total	UK	DE	USA	Spain
Adult PwD (ages 18 years and older) using analog insulin pen					
Type 1 Diabetes	300	100	100	100	n/a
Type 2 Diabetes	850	250	300	300	n/a
PwD Total	1150	350	400	400	n/a
HCPs routinely treating PwD					
Specialists	320	80	80	80	80
Primary Care Physicians	320	80	80	80	80
HCP Total	640	160	160	160	160

Abbreviations: DE=Germany; HCPs=healthcare professionals; PwD=people with diabetes; UK=United Kingdom; USA=United States of America. No notable differences between participants with type 1 diabetes and type 2 diabetes.

Table 2. Number of times PwD reported they missed/skipped or mis-timed an insulin dose in the past 30 days

		Total (N=1150)	Country		
			UK (N=350)	DE (N=400)	USA (N=400)
Missed or Skipped					
Bolus	n (%)	645 (56.1%)	233 (66.6%)	230 (57.5%)	182 (45.5%)
	Mean (SD)	4.8 (8.3)	4.3 (4.7)	5.2 (9.3)	5.0 (10.3)
Basal	n (%)	554 (48.2%)	199 (56.9%)	189 (47.3%)	166 (41.5%)
	Mean (SD)	3.6 (3.6)	4.1 (4.0)	3.5 (2.9)	3.1 (3.8)
Mis-timed					
Bolus	n (%)	456 (39.7%)	155 (44.3%)	153 (38.3%)	148 (37.0%)
	Mean (SD)	5.1 (8.3)	5.4 (10.4)	5.0 (7.1)	4.9 (6.3)
Basal	n (%)	526 (45.7%)	188 (53.7%)	189 (47.3%)	149 (37.3%)
	Mean (SD)	3.9 (4.0)	4.4 (4.0)	3.9 (4.3)	3.1 (3.3)

Abbreviations: DE=Germany; PwD=people with diabetes; SD=standard deviation; UK=United Kingdom; USA=United States of America. Reasons for missed/skipped or mis-timed dose other than not eating.

Table 3. Percentage of HCPs estimating the proportion of PwD who missed/skipped or mis-timed insulin doses in the past 30 days

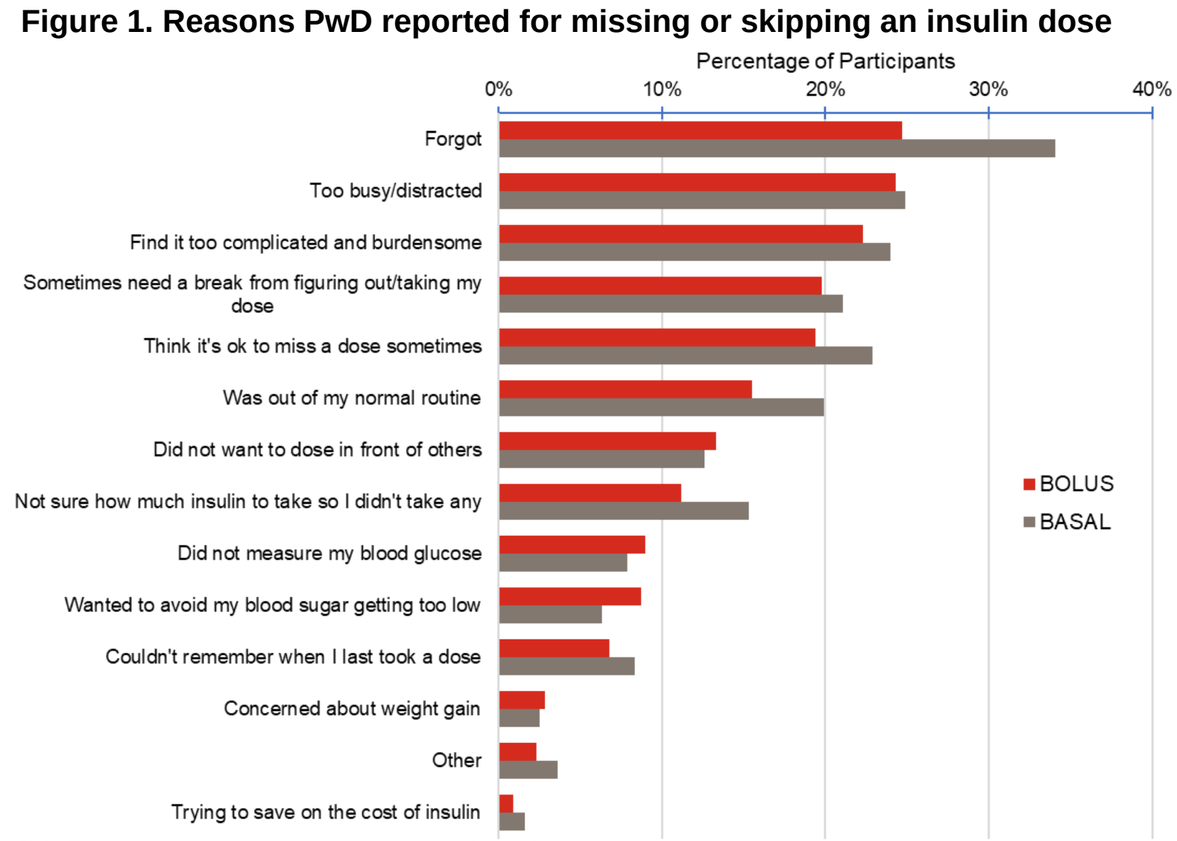
Estimated proportion of PwD missing/skipping or mis-timing dose	% HCPs who Estimated PwD Miss/Skip Insulin Dose		% of HCPs who Estimated PwD Mis-time Insulin Dose	
	BOLUS	BASAL	BOLUS	BASAL
0/None	10.2%	15.7%	9.0%	14.8%
1 - 20%	55.2%	61.1%	52.9%	59.5%
21 - 30%	13.1%	9.2%	14.2%	10.7%
31 - 40%	6.6%	5.0%	8.2%	5.9%
41% or more	14.9%	9.0%	15.7%	9.1%

Abbreviations: HCPs=healthcare professionals; PwD=people with diabetes. Note: Excludes missing a dose due to skipping a meal. Minimal differences were noted across countries or between type 1 diabetes and type 2 so only total shown. Data are an average across responses to separate questions about patients with type 1 and type 2 diabetes.

RESULTS

- Overall, 56% and 48% of PwD reported missing bolus and basal doses in the past 30 days, respectively.
  - Among those who reported missing doses, this corresponded to an average of 4.8 (SD=8.3) bolus doses and 3.6 (SD=3.6) basal doses (**Table 2**).
  - PwD reported forgetting, being too busy/distracted, and finding it too complicated/burdensome as key reasons for missed doses (**Figure 1**).
- Overall, 40% and 46% of PwD reported mis-timing bolus and basal doses, respectively, in the past 30 days.
  - Among those who reported mis-timing doses, this corresponded to an average of 5.1 (SD=8.1) bolus doses and 3.9 (SD=4.0) basal doses (**Table 2**).
  - Key reasons PwD reported for mis-timed doses included being too busy/distracted, being out of routine, forgetting, or having an unexpected or earlier/later-than-expected meal (**Figure 2**).
- In general, most HCPs estimated fewer than 20% and fewer than 30% of PwD were missing basal and bolus doses, respectively (**Table 3**).

Figure 1. Reasons PwD reported for missing or skipping an insulin dose



Note: Reasons for missing or skipping insulin dose other than not eating

Figure 2. Reasons PwD reported for mis-timing an insulin dose

Note: Reasons for mis-timed insulin dose other than not eating

CONCLUSIONS

- Suboptimal insulin dosing is prevalent among PwD, being reported as missed or mis-timed insulin doses, largely for preventable reasons
  - Results demonstrate a disconnect between HCP perception and actual self-reported dosing behaviours
- This survey highlights the need for integrated and automated insulin dosing support to:
  - Manage the complexity of insulin treatment
  - Improve communication between PwD and physicians
  - Ultimately, improve health and quality of life outcomes for PwD by reducing suboptimal insulin dosing

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