

Appendix 2. Comparability analysis and description of the missing data imputation model

Comparability analysis

For comparability analysis, the baseline characteristics of patients (gender, age, HbA1c, BMI, time since diagnosis, presence of comorbidities, and pubertal stage) were compared between participants who completed the different follow-up phases and those who had total or partial loss to follow-up at 3, 6, and 12 months. No significant differences were found for any of these variables at the 3-month follow-up. At 6 months, significant differences were observed between responders and non-responders in relation to pubertal stage V (25% vs. 75%) ($p = 0.04$). At the 12-month follow-up, differences were observed in pubertal stages IV (21.7% vs. 78.3%) and V (31.2% vs. 68.8%) ($p = 0.007$); significant differences were also observed in the mean age value ($p = 0.04$) between responders (12.3 years) and non-responders (13.7 years).

	3 months			6 months			12 months		
	Participants lost to follow-up (n=6)	Participants who continued in the study (n=150)	p	Participants lost to follow-up (n=20)	Participants who continued in the study (n=136)	p	Participants lost to follow-up (n=28)	Participants who continued in the study (n=128)	p
Sex (male), n (%)	4 (4.7)	82 (95.3)	0.562	8 (9.3)	78 (90.7)	0.145	16 (18.6)	70 (81.4)	0.813
Age (years), mean (SD)	13 (4.86)	12.55 (3.09)	0.829	13.3 (3.81)	12.46 (3.05)	0.266	13.68 (2.91)	12.32 (3.17)	0.039
HbA1c, mean (SD)	8.42 (0.62)	7.83 (1.38)	0.303	8.36 (2.01)	7.78 (1.23)	0.224	8.08 (1.81)	7.81 (1.24)	0.33
BMI, mean (SD)	20.73 (2.87)	20.28 (4.10)	0.789	21.33 (2.91)	20.14 (4.18)	0.224	21.33 (2.88)	20.07 (4.24)	0.135
Duration of DM1, mean (SD)	7.19 (3.86)	5.59 (3.37)	0.257	6.42 (3.43)	5.54 (3.38)	0.275	6.74 (3.39)	5.41 (3.36)	0.061
Presence of comorbidities, n (%)	1 (2.0)	49 (98.0)	0.41	7 (14)	43 (86)	0.762	9 (18)	41 (82)	0.991
Pubertal status, n (%)			0.473			0.043			0.007
I	2 (3.9)	49 (96.1)		5 (9.8)	46 (90.2)		5 (9.8)	46 (90.2)	
II	0 (0)	14 (100)		1 (7.1)	13 (92.9)		3 (21.4)	11 (78.6)	
III	0 (0)	20 (100)		0 (0)	20 (100)		0 (0)	20 (100)	
IV	0 (0)	23 (100)		2 (8.7)	21 (91.3)		5 (21.7)	18 (78.3)	
V	4 (8.3)	44 (91.7)		12 (25)	36 (75)		15 (31.2)	33 (68.8)	

SD = Standard deviation; HbA1c = Glycated haemoglobin; BMI = Body mass index.

Description of the missing data imputation model

For multiple imputation was performed by chained equations using Stata 15.0 software. The variables sex, age, pubertal stage, presence of comorbidities and duration of diabetes were considered regular and used as predictors for imputation. A total of 29 variables were imputed. Each variable was imputed in chronological order: 3, 6 and 12 months. As a general rule, the latest available information on the variable to be imputed was used. When information from other variables was used, the information from the same point in time was used. A total of 10 imputations were made for each missing data.

Order	Imputed variable	Variables used in imputation	Imputation model	n (%) missing
1	HbA1c 3M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c Baseline	pmm	7 (4.5)
2	HbA1c 6M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 3M	pmm	20 (12.8)
3	HbA1c 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 6M	pmm	28 (17.9)
4	BMI 6M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, BMI Baseline	pmm	24 (15.4)
5	BMI 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, BMI 6M	pmm	28 (17.9)
6	N. ° severe hypoglycaemia events 3M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events Baseline	poisson	7 (4.5)
7	N. ° severe hypoglycaemia events 6M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events 3M	poisson	7 (4.5)
8	N. ° severe hypoglycaemia events 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events 6M	poisson	7 (4.5)
9	N. ° severe hypoglycaemia events on EHR 3M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events 3M, N. ° severe hypoglycaemia events on EHR Baseline	poisson	8 (5.1)
10	N. ° severe hypoglycaemia events on EHR 6M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events 6M, N. ° severe hypoglycaemia events on EHR 3M	poisson	28 (17.9)
11	N. ° severe hypoglycaemia events on EHR 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events 12M, N. ° severe hypoglycaemia events on EHR 6M	poisson	28 (17.9)
12	VAS 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, Mobility EQ-5D-Y 12M, Self-care EQ-5D-Y 12M, Habitual activities EQ-5D-Y 12M, Pain/discomfort EQ-5D-Y 12M, Anxiety/depression EQ-5D-Y 12M, VAS Baseline	pmm	36 (23.1)
13	Knowledge about Baseline	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c Baseline, BMI Baseline	pmm	14 (9.0)
14	Knowledge about 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 12M, BMI 12M, Knowledge about Baseline	pmm	48 (30.8)
15	Hyperglycaemia DTSQ Baseline	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c Baseline, Knowledge about Baseline	pmm	14 (9.0)
16	Hyperglycaemia DTSQ 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 12M, Knowledge about 12M, Hyperglycaemia DTSQ Baseline	pmm	48 (30.8)
17	Hypoglycaemia DTSQ Baseline	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis	pmm	14 (9.0)
18	Hypoglycaemia DTSQ 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, Hypoglycaemia DTSQ Baseline	pmm	48 (30.8)

19	Satisfaction with treatment DTSQ Baseline	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events Baseline, N. ° severe hypoglycaemia events on EHR Baseline, Knowledge about Baseline, Hyperglycaemia DTSQ Baseline,	pmm	14 (9.0)
20	Satisfaction with treatment DTSQ 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° severe hypoglycaemia events 12M, N. ° severe hypoglycaemia events on EHR 12M, Knowledge about 12M, Hyperglycaemia DTSQ 12M, Satisfaction with treatment DTSQ Baseline	pmm	48 (30.8)
21	N. ° of daily scans 3M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 3M, BMI Baseline, N. ° severe hypoglycaemia events 3M	pmm	8 (5.1)
22	N. ° of daily scans 6M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 6M, BMI 6M, N. ° severe hypoglycaemia events 6M, N. ° of daily scans 3M	pmm	19 (12.2)
23	N. ° of daily scans 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 12M, BMI 12M, N. ° severe hypoglycaemia events 12M, N. ° of daily scans 6M	pmm	28 (17.9)
24	Sensor usage time 3M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 3M, N. ° ketoacidosis 3M, N. ° of daily scans 3M	pmm	8 (5.1)
25	Sensor usage time 6M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 6M, N. ° ketoacidosis 6M, N. ° of daily scans 6M, Sensor usage time 3M	pmm	19 (12.2)
26	Sensor usage time 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, HbA1c 12M, N. ° ketoacidosis 12M, N. ° of daily scans 12M, Sensor usage time 6M	pmm	28 (17.9)
27	N. ° Sensors 3M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° ketoacidosis 3M, Sensor usage time 3M	pmm	7 (4.5)
28	N. ° Sensors 6M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° ketoacidosis 6M, Sensor usage time 6M, N. ° Sensors 3M	pmm	19 (12.2)
29	N. ° Sensors 12M	Sex, Age, Pubertal stage, Presence of comorbidities, Time since diagnosis, N. ° ketoacidosis 12M, Sensor usage time 12M, N. ° Sensors 6M	pmm	28 (17.9)
DM = Diabetes Mellitus; T1DM = Type 1 Diabetes Mellitus; DTSQ = Diabetes Treatment Satisfaction Questionnaire; EQ-5D-Y = Health-related quality of life questionnaire; VAS = visual analogue scale; HbA1c = Glycated haemoglobin; EHR = Electronic Health Record; BMI = Body mass index; M = Months.				