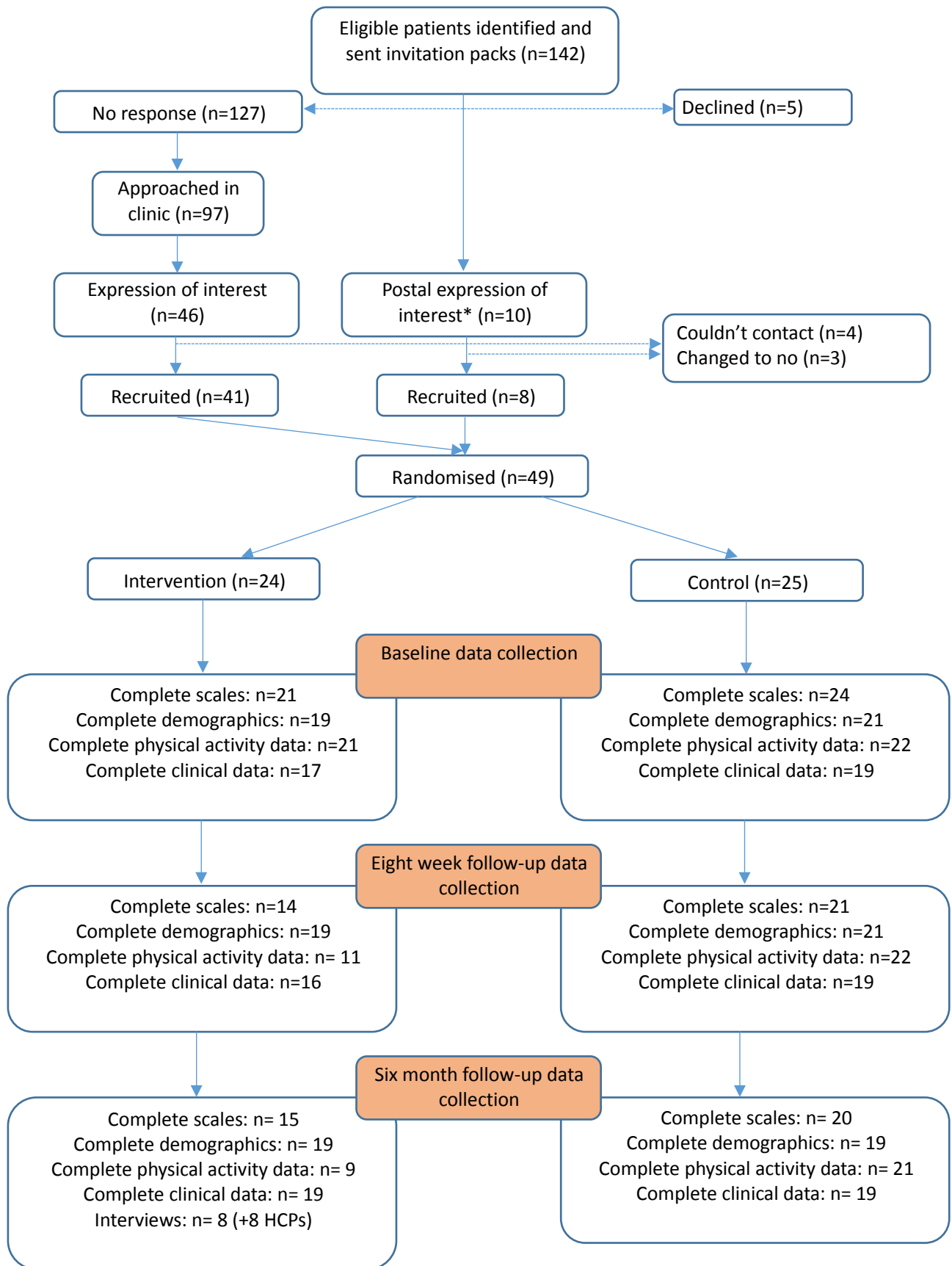


Participant flow diagram:



Baseline Characteristics:

Demographic or clinical characteristics	Control (N=25)	Intervention (N=24)	All
Mean age (SD)	10.89 (0.9)	10.40 (1.1)	10.63 (1.0)
BMI (kg/m²)	17.09 (2.0)	20.69 (3.6)	18.98 (3.4)
Basal insulin dose (units)	11.06 (6.1)	12.30 (6.3)	11.71 (6.1)
Bolus insulin dose (units)	18.18 (9.4)	23.69 (20.6)	21.08 (16.3)
	N (%)	N (%)	N (%)
Site			
NUH	13 (52.0)	15 (62.5)	28 (57.1)
UHL	12 (48.0)	9 (37.5)	21 (42.9)
Gender			
Female	8 (32.0)	14 (58.3)	22 (44.9)
Male	17 (68.0)	10 (41.7)	27 (55.1)
Ethnic origin			
White	22 (88.0)	20 (83.3)	42 (85.7)
Black British	0 (0.0)	1 (4.2)	1 (2.0)
Asian	1 (4.0)	1 (4.2)	2 (4.1)
Mixed race	1 (4.0)	2 (8.3)	3 (6.1)
Other	1 (4.0)	0 (0.0)	1 (2.0)
Insulin delivery method			
Multiple daily injections	7 (29.2)	7 (30.4)	14 (29.8)
Insulin pump	16 (66.7)	15 (65.2)	31 (66.0)
Insulin pen	1 (4.2)	1 (4.3)	2 (4.3)
Method of glucose monitoring			
Self-monitoring	20 (83.3)	18 (78.3)	38 (80.9)
Continuous glucose monitoring system	4 (16.7)	5 (21.7)	9 (19.1)
Mother's attributes			
Lives with mother	23 (95.8)	22 (95.7)	45 (95.7)
Mother employed	17 (68.0)	18 (78.3)	35 (72.9)
Mother without formal educational qualifications	4 (16.0)	2 (10.0)	6 (13.3)
Father's attributes			
Lives with father	23 (95.8)	17 (73.9)	40 (85.1)
Father employed	20 (83.3)	18 (81.8)	38 (82.6)
Father without formal educational qualifications	2 (8.0)	5 (23.8)	7 (15.2)
Family income			
Less than £20,000	3 (13.0)	6 (27.2)	9 (20.0)
£20,000-£40,000	8 (34.7)	7 (31.8)	15 (33.4)
More than £40,000	11 (47.8)	9 (40.9)	20 (44.4)

Outcome measures:

1. Recruitment rate

Of the 154 participants identified as eligible to take part in the study, 56 expressed an interest in writing, of which 49 were enrolled into the study. The main reason for not recruiting after receipt of an expression of interest was that the patient was not contactable.

2. Pattern of intervention use

Number of visits per week to STAK-D pages averaged 12.37 at baseline, 4.31 between baseline and six-months, and 0.55 between six-months and 12-months, respectively. Downloads per week of the goal sheet and goal certificate respectively averaged 0.14 and 0.00 at baseline, 0.01 and 0.02 at six-months, and 0.00 and 0.00 at 12-months. The 'Kids Zone' was the most visited page.

3. User satisfaction with STAK-D

Every child interviewed reported becoming more physically active at some point during the course of their involvement in SKIP, though this was often only for the short-term. Interviews exposed a range of competition for the STAK-D programme that may have discouraged active engagement; these included available alternative systems which targeted similar behaviours, competition from commercially available alternative monitors, and support or information from other sources (e.g. friends, family) which rendered STAK-D unnecessary. A number of suggestions were made to improve STAK-D: rewards, improved technological functionality, automaticity of feedback, greater family involvement and greater variety of content.

4. Retention rate and 5. Data completion rate

Completion of individual scales at baseline, eight week follow-up and six month follow-up

	Baseline completion (N=49), n (%)	Eight week completion (N=37), n (%)	Six month completion (N=38), n (%)
Child measures			
Communication	49 (100)	37 (100)	38 (100)
PAQ	48 (98.0)	37 (100)	36 (94.7)
HFS	45 (91.8)	33 (89.2)	36 (94.7)
CSAPPA	48 (98.0)	35 (94.6)	37 (97.4)
CHU9D	48 (98.0)	37 (100.0)	38 (100)
Burden	48 (98.0)	37 (100.0)	37 (97.4)
Clinical record (N=49)	32 (65.3)	31 (63.3)	31 (63.3)
Parent measures			
Baseline	47 (95.9)	37 (100)	37 (97.4)
CHQ	45 (91.8)	34 (91.9)	38 (100)
HFS	48 (98)	35 (94.6)	36 (94.7)
Burden	47 (95.9)	37 (100.0)	37 (94.7)
Clinician measures			
Communication*	49 (100)	43 (87.8)	39 (79.6)
Objective physical activity			
at least 600 minutes ≥ three days/week	43 (87.8)	33 (89.2)	30 (78.9)

PAQ: Physical activity questionnaire; HFS: Hypoglycaemia fear survey; CSAPPA: Children's self-perceptions of adequacy in and predilection for physical activity scale; CHU9D: Children's healthy utility scale; CHQ: Children's health questionnaires. * N=49 for baseline, eight week and six month follow-ups.

6. Feasibility of gathering routinely collected clinic data from patients' electronic diabetes record

49 child-parent dyads were recruited; 25 to the control group and 24 to STAK-D.

Children's mean age was 10.6 years. Children were predominantly white (85.7%; n=42), 55.1% (n=27) male, self-monitored their glucose (80.9%; n=38) and were mostly on an insulin pump (66.0%; n=31).

BMI was calculated for 98% of children (n=48) at baseline, 93.9% of children (n=46) at eight weeks and 83.7% of children (n=41) at 6 months. Insulin dosage was provided for 73.5% of children (n=36) at baseline, 75.5% of children (n=37) at 8 weeks and 69.4% of children (n=34) at six months. All children had valid HbA1c data at all time-points. The collection of clinical data was therefore acceptable.

The only study measures not reaching the feasibility target of 85% completion were objective physical activity at T2 and insulin dosage at all time-points. A total of 78.9% (n=30) of children who were successfully visited at T2, provided sufficient physical activity data, which was only marginally short of the feasibility target.

Secondary outcome measures:

Means and standard deviations for collected variables at baseline, eight weeks and six months according to group.

	Baseline		Eight week		Six month	
	Control	INT	Control	INT	Control	INT
Child measures						
Communication	1.28 ± 1.06	1.04 ± 1.46	0.78 ± 0.90	1.21 ± 1.05	1.10 ± 1.14	0.94 ± 1.34
PAQ physical activity score	57.48 ± 8.45	56.61 ± 8.77	57.57 ± 13.33	57.36 ± 8.65	58.05 ± 14.28	56.80 ± 9.12
PAQ sedentary score	22.48 ± 4.48	23.04 ± 3.65	22.70 ± 4.29	20.21 ± 3.73	22.29 ± 4.85	21.47 ± 3.91
Frequency of after school clubs	4.09 ± 4.34	4.09 ± 4.34	5.57 ± 5.68	5.57 ± 5.68	5.06 ± 3.36	5.06 ± 3.36
HFS worry	15.76 ± 10.47	19.35 ± 13.05	12.30 ± 7.10	16.36 ± 12.13	13.20 ± 12.37	12.69 ± 14.83
HFS do	18.68 ± 6.10	19.04 ± 7.08	16.70 ± 5.91	19.21 ± 7.80	18.76 ± 6.08	17.94 ± 6.61
HFS total	34.44 ± 11.93	38.39 ± 16.94	29.00 ± 10.49	35.57 ± 16.04	31.60 ± 11.74	30.63 ± 18.70
CSAPPA adequacy	22.12 ± 4.28	22.42 ± 3.93	21.61 ± 5.32	23.36 ± 4.34	21.52 ± 5.59	23.25 ± 2.71
CSAPPA predilection	28.36 ± 4.80	27.54 ± 5.28	32.17 ± 5.77	32.39 ± 5.46	31.86 ± 5.70	32.19 ± 5.59
CSAPPA enjoyment	10.56 ± 1.53	10.42 ± 1.56	10.65 ± 1.92	10.79 ± 1.42	10.67 ± 1.88	10.94 ± 1.29
CSAPPA	65.12 ± 9.52	64.29 ± 9.29	64.43 ± 12.16	66.43 ± 10.27	64.05 ± 12.00	66.38 ± 8.47
CHU9D	12.72 ± 3.30	12.17 ± 3.63	12.78 ± 2.78	12.36 ± 3.15	12.71 ± 3.42	14.13 ± 5.14
HbA1c (mmol/mol)	53.50 ± 11.61	54.57 ± 9.37	53.58 ± 8.83	58.91 ± 9.05	55.65 ± 8.31	61.09 ± 14.96
HbA1c (%)	7.00 ± 1.18	7.15 ± 0.85	7.05 ± 0.81	7.52 ± 0.83	7.24 ± 0.77	7.73 ± 1.38
Parent measures						
Baseline	1.28 ± 1.06	1.04 ± 1.46	0.78 ± 0.90	1.21 ± 1.05	1.10 ± 1.14	0.94 ± 1.34
Days off school	2.60 ± 9.33	1.96 ± 2.98	0.57 ± 1.20	1.00 ± 1.57	0.38 ± 1.16	1.25 ± 1.77
CHQ physical T-score	47.99 ± 9.62	44.92 ± 12.16	46.30 ± 10.90	51.77 ± 6.21	47.81 ± 9.67	50.06 ± 9.76
CHQ psychological T-score	48.83 ± 11.98	44.79 ± 14.12	48.35 ± 11.37	48.53 ± 9.55	51.01 ± 11.75	47.61 ± 11.91
HFS worry	25.72 ± 15.56	29.09 ± 14.91	24.91 ± 15.29	21.93 ± 11.18	21.33 ± 15.73	21.00 ± 13.22
HFS do	20.92 ± 5.07	23.87 ± 5.94	23.35 ± 5.02	23.07 ± 6.81	21.38 ± 6.70	20.81 ± 6.86
HFS total	46.64 ± 17.89	52.96 ± 19.25	48.26 ± 17.53	45.00 ± 15.82	42.71 ± 19.90	41.81 ± 16.57
HbA1c low knowledge	0.13 ± 0.56	0.12 ± 0.63	0.14 ± 0.63	0.15 ± 0.36	0.25 ± 0.90	0.12 ± 0.39
HbA1c high	2.96 ± 2.39	2.82 ± 2.69	3.07 ± 2.43	2.96 ± 2.47	3.33 ± 2.69	2.56 ± 2.94

knowledge

Burden

Clinician

measures

Communication 19.36 ± 4.32 19.42 ± 3.62 21.09 ± 3.63 21.58 ± 3.15 21.62 ± 3.23 22.59 ± 2.43

Objective

physical activity

Weekly steps 16183 ± 4717 16004±4462 16524 ± 4294 18562± 4746 16323± 4058 18215± 5755

Moderate- 74.29 ± 33.09 66.18±29.17 73.29 ± 31.31 79.83±31.62 68.64±34.83 87.19± 46.30
vigorous minutes

Easy minutes 201.87 ±184.38± 208.17± 50.91 198.51± 186.26± 67.44 150.82 ± 57.71 82.72 90.18 100.52

Very easy 549.66 ±511.85 ±562.34 ±549.57 ±593.37 ±669.09 ± 178.31 138.37 184.42 157.32 147.68 288.42
minutes

INT: Intervention group; PAQ: Physical Activity Questionnaire; HFS worry: Fear of Hypoglycaemia Survey, worry subscale HFS do: Fear of Hypoglycaemia Survey, action subscale; CSAPPA: Children's Self-perception of Adequacy in and Predilection for Physical Activity questionnaire; CHU9D: Child's Health Utility form; CHQ: Child Health Questionnaire; HbA1C low knowledge: Accuracy of parent's knowledge of the lowest acceptable value for HbA1c; HbA1c high knowledge: Accuracy of parent's knowledge of the highest acceptable value for HbA1c.

Adverse events

No adverse events were reported by participants or wider project staff.