

S1 Table. Details on lottery drawing using illustrative winning number of 38

Lottery type	Rules	Prize	Chance of winning	Sample numbers that win each prize
Low performance threshold				
Small prize	Match 1 number in order	\$25	18%	32, 58
Large prize	Match 2 numbers in order	\$50	1%	38
High performance threshold				
Small prize	Match 1 number regardless of order	\$25	34%	32, 23, 58, 85
Large prize	Match 2 numbers regardless of order	\$50	4%	38, 83

Note: The low performance threshold was 7 qualifying episodes per week (roughly one per day). The high performance threshold was 14 qualifying episodes per day (twice per day).

S2 Table. SMS message bank

Arm	Adherence threshold	Won small prize	Won large prize	Frequency	Message text
<b>Reminder messages</b>					
All		.	.	Wed, Fri, Sun	BEECON: Please remember to sync your brush by the end of today.
<b>Feedback messages</b>					
Control	Below low-adherence (< 1/day)	.	.	Tue after week's end	BEECON: You brushed [X] times last week. You earned \$[Y] for syncing. Total earned to date: \$[Z].
	Met low-adherence ( $\geq 1$ /day)	.	.	Tue after week's end	BEECON: You brushed [X] times last week. Nice job. You earned \$[Y] for syncing. Total earned to date: \$[Z].
	Met high-adherence ( $\geq 2$ /day)	.	.	Tue after week's end	BEECON: You brushed [X] times last week. Great job! You earned \$[Y] for syncing. Total earned to date: \$[Z].
Fixed incentive	Below low-adherence (< 1/day)	.	.	Tue after week's end	BEECON: You brushed [X] times last week. You earned \$[Y] for syncing. Total earned to date: \$[Z].
	Met low-adherence ( $\geq 1$ /day)	.	.	Tue after week's end	BEECON: You brushed [X] times last week and earned \$5. Nice job. You earned another \$[Y] for syncing. Total earned to date: \$[Z].
	Met high-adherence ( $\geq 2$ /day)	.	.	Tue after week's end	BEECON: You brushed [X] times last week and earned \$10. Great job! You earned another \$[Y] for syncing. Total earned to date: \$[Z].
Lottery incentive	Below low-adherence (< 1/day)	No	No	Tue after week's end	BEECON: You brushed [X] times last week. You did not win this week's drawing (winning # [NM]). You earned \$[Y] for syncing. Total to date: \$[Z].
	Met low-adherence ( $\geq 1$ /day)	No	No	Tue after week's end	BEECON: You brushed [X] times last week. Nice job. You did not win this week's drawing (winning # [NM]). You earned \$[Y] for syncing. Total to date: \$[Z].
	Met high-adherence ( $\geq 2$ /day)	No	No	Tue after week's end	BEECON: You brushed [X] times last week. Great job! You did not win this week's drawing (winning # [NM]). You earned \$[Y] for syncing. Total to date: \$[Z].
	Below low-adherence (< 1/day)	Yes	No	Tue after week's end	BEECON: You brushed [X] times last week. You would have won \$25 for brushing more (winning # [NM]). You earned \$[Y] for syncing. Total to date: \$[Z].

Arm	Adherence threshold	Won small prize	Won large prize	Frequency	Message text
	Met low-adherence ( $\geq 1/\text{day}$ )	Yes	No	Tue after week's end	BEECON: You brushed [X] times last week. Nice job. You won the \$25 drawing for brushing (winning # [NM])! You earned \$[Y] for syncing. Total to date: \$[Z].
	Met high-adherence ( $\geq 2/\text{day}$ )	Yes	No	Tue after week's end	BEECON: You brushed [X] times last week. Great job! You won the \$25 drawing for brushing (winning # [NM])! You earned \$[Y] for syncing. Total to date: \$[Z].
	Below low-adherence ( $< 1/\text{day}$ )	No	Yes	Tue after week's end	BEECON: You brushed [X] times last week. You would have won \$50 for brushing more (winning # [NM]). You earned \$[Y] for syncing. Total to date: \$[Z].
	Met low-adherence ( $\geq 1/\text{day}$ )	No	Yes	Tue after week's end	BEECON: You brushed [X] times last week. Nice job. You won the \$50 drawing for brushing (winning # [NM])! You earned \$[Y] for syncing. Total to date: \$[Z].
	Met high-adherence ( $\geq 2/\text{day}$ )	No	Yes	Tue after week's end	BEECON: You brushed [X] times last week. Great job! You won the \$50 drawing for brushing (winning # [NM])! You earned \$[Y] for syncing. Total to date: \$[Z].
<b>Lottery number selection</b>					
Lottery incentive	.	.	.	Sun	BEECON: Want to choose a number for this week's drawing? Reply with 1 number from 1 to 99.

Note: In the message text, [X] denotes the number of brushing episodes that week; [Y] denotes the number of dollars earned for syncing that week (\$0 or \$3); [Z] denotes cumulative dollars earned to that point' and [NM] denotes the two-digit winning lottery number that week.

S3 Table. Effects of incentive packages on number of qualifying brushing episodes

	(1)	(2)
	Toothbrushing episodes	Toothbrushing episodes
Control (ref)		
Fixed incentives	0.14 (-3.65, 3.94)	0.14 (-3.65, 3.94)
Lottery incentives	2.06 (-1.82, 5.93)	2.06 (-1.82, 5.93)
Constant	3.91 (1.17, 6.65)	5.64 (2.81, 8.46)
sd(Constant)	4.37 (3.38, 5.66)	4.39 (3.39, 5.67)
sd(Residual)	2.46 (2.24, 2.69)	2.25 (2.05, 2.46)
Week indicators	No	Yes
No. observations	272	272
No. clusters	34	34
Log likelihood	-684	-655
Mean dependent var. for control group	3.91	3.91

Note: Linear mixed-effects model with a random effect for child-parent dyad and 95% confidence intervals (in parentheses). Model 2 also includes indicators for study week.

S4 Table. Pairwise correlation between toothbrushing measures

	Mean Bluetooth episodes per week	Mean diary episodes per week	Plaque score at follow-up (in person)	Plaque score at follow-up (iPhone)	Change in pump weight
Mean Bluetooth episodes per week	1.0000 [34]				
Mean diary episodes per week	0.1828 [17]	1.0000 [18]			
Plaque score at follow-up (in person)	0.0812 [24]	0.0960 [17]	1.0000 [26]		
Plaque score at follow-up (iPhone)	0.0095 [23]	-0.2396 [16]	0.6839 [25]	1.0000 [25]	
Change in pump weight (in ounces)	0.1047 [24]	-0.0736 [18]	0.1360 [25]	0.0579 [24]	1.0000 [26]

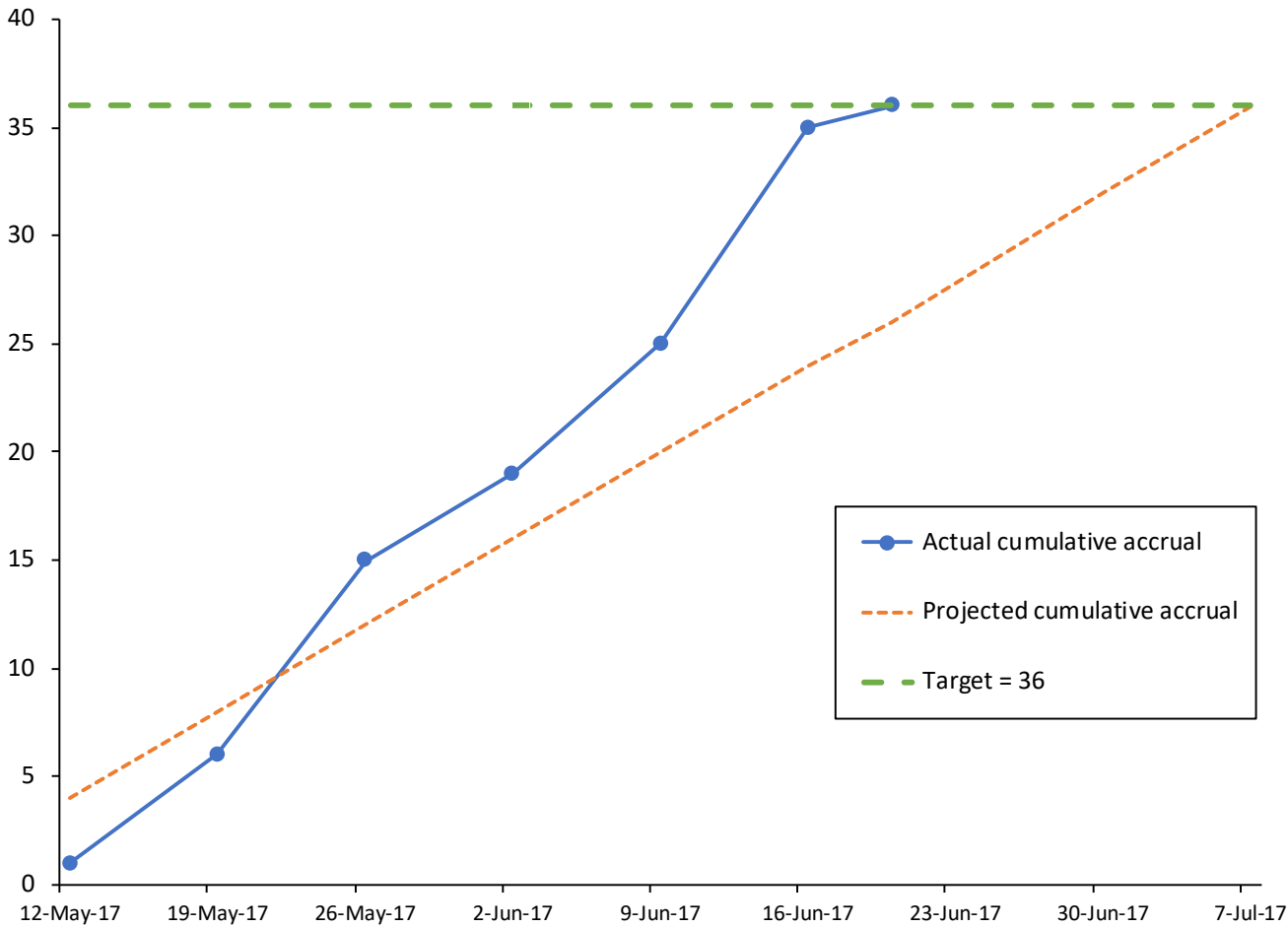
Note: This table shows pairwise correlation coefficients between toothbrushing measures. Number of observations for each comparison is in brackets.

S5 Table. Selected secondary outcome measures by age group

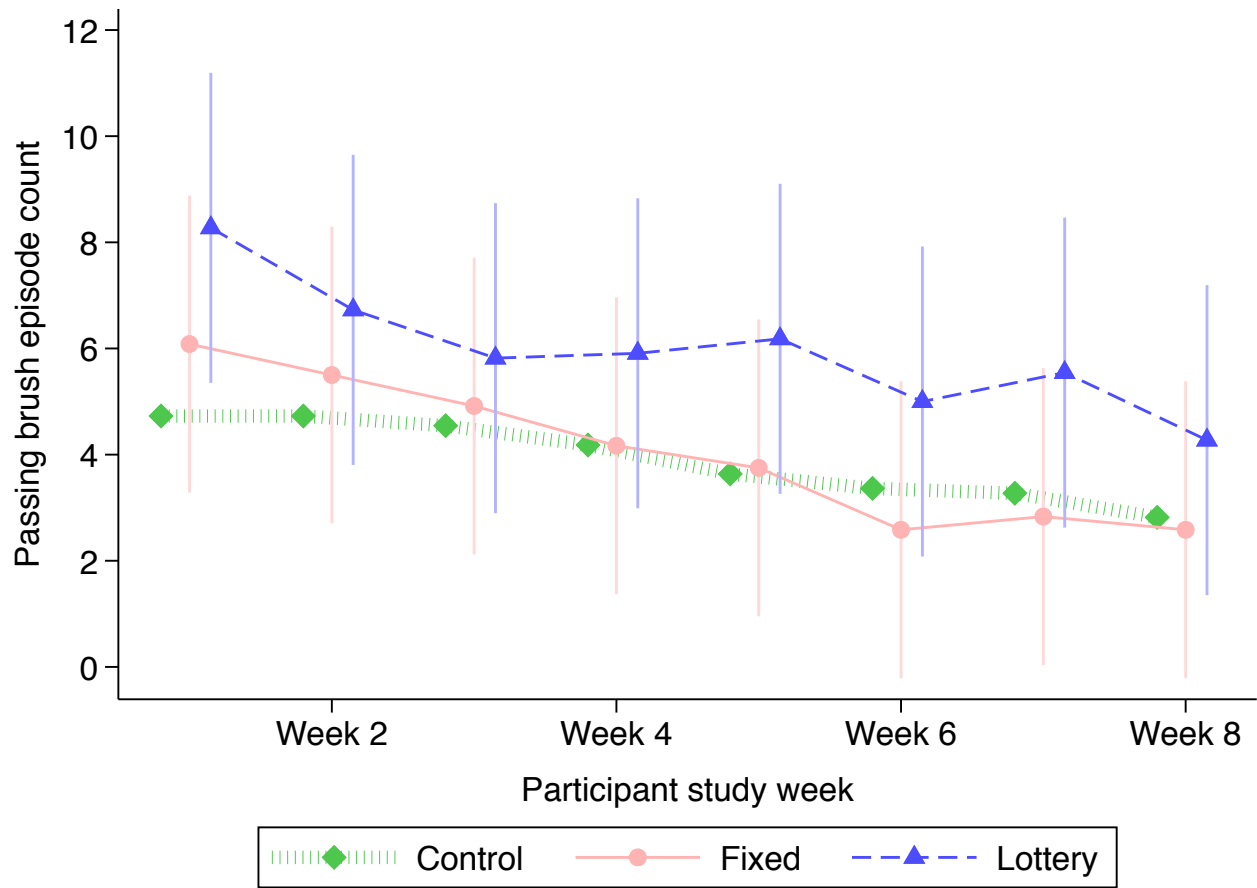
	Total	Age group	
		≤24 months	>24 months
Child comfortable with smart powered brush	12/26 (46%)	3/11 (27%)	9/15 (60%)
Child cooperated for baseline disclosing gel application	168/565 (30%)	30/207 (14%)	138/358 (39%)
Child cooperated for baseline plaque image (iPhone)	212/565 (38%)	44/207 (21%)	168/358 (47%)

Note: Data for complete cases are presented “n/N (%)”.

S1 Figure. Trial accrual



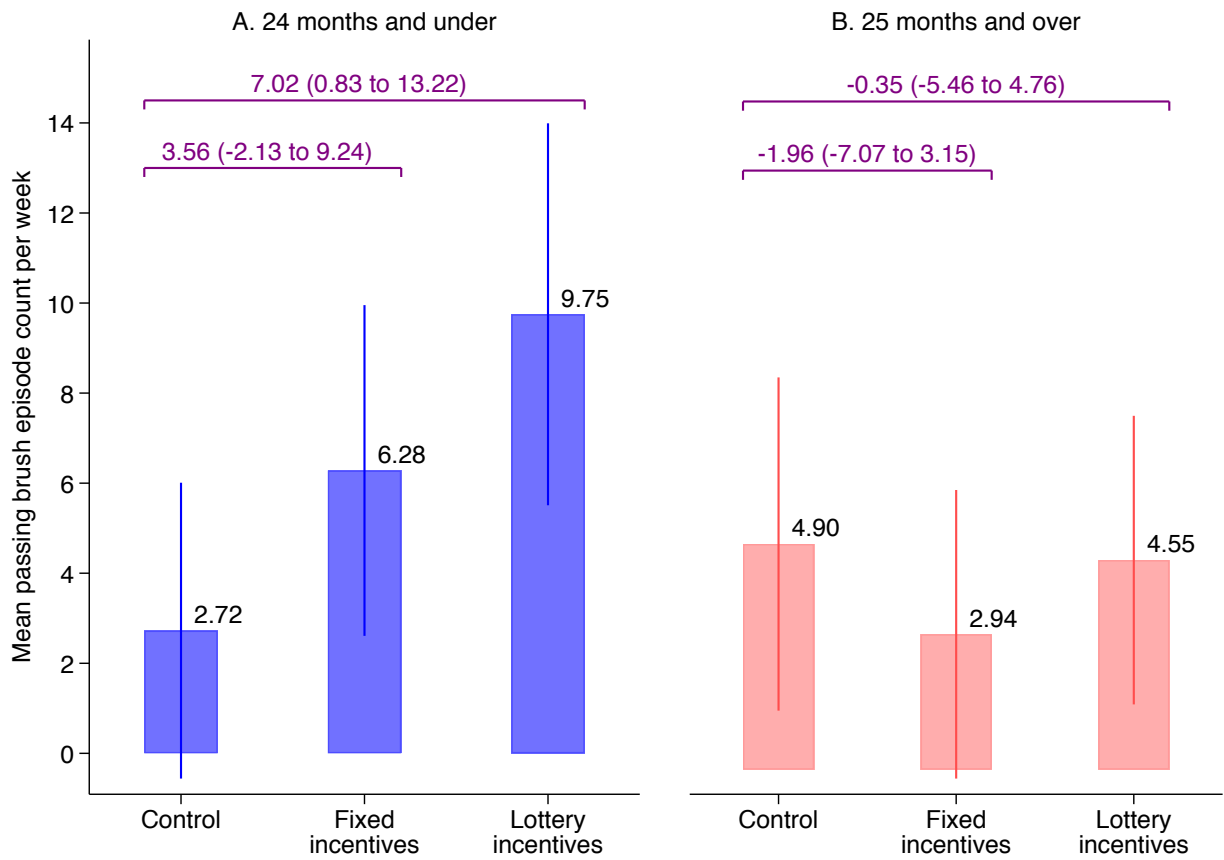
S2 Figure. Effects of each incentive package on toothbrushing episodes by study week



Note: This figure shows a linear prediction of the fixed portion of the mixed-effects model with a random effect for child-parent dyad. Error bars represent 95% confidence intervals.

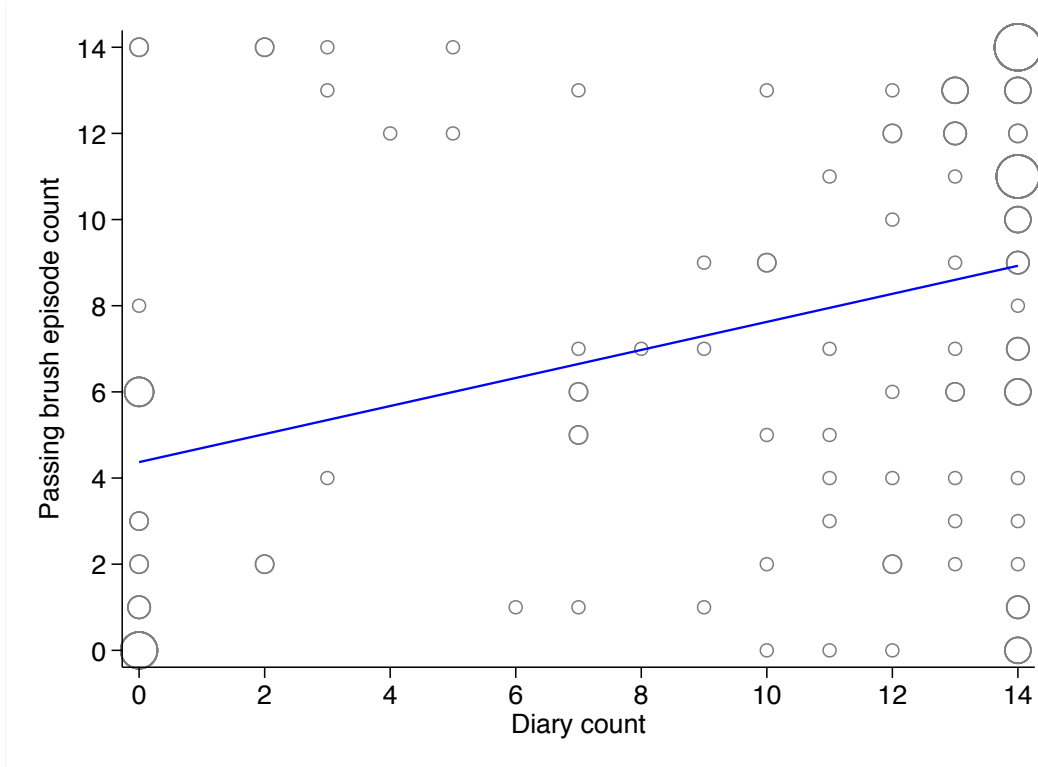


S3 Figure. Effects of each incentive package on toothbrushing episodes per week, by child age group



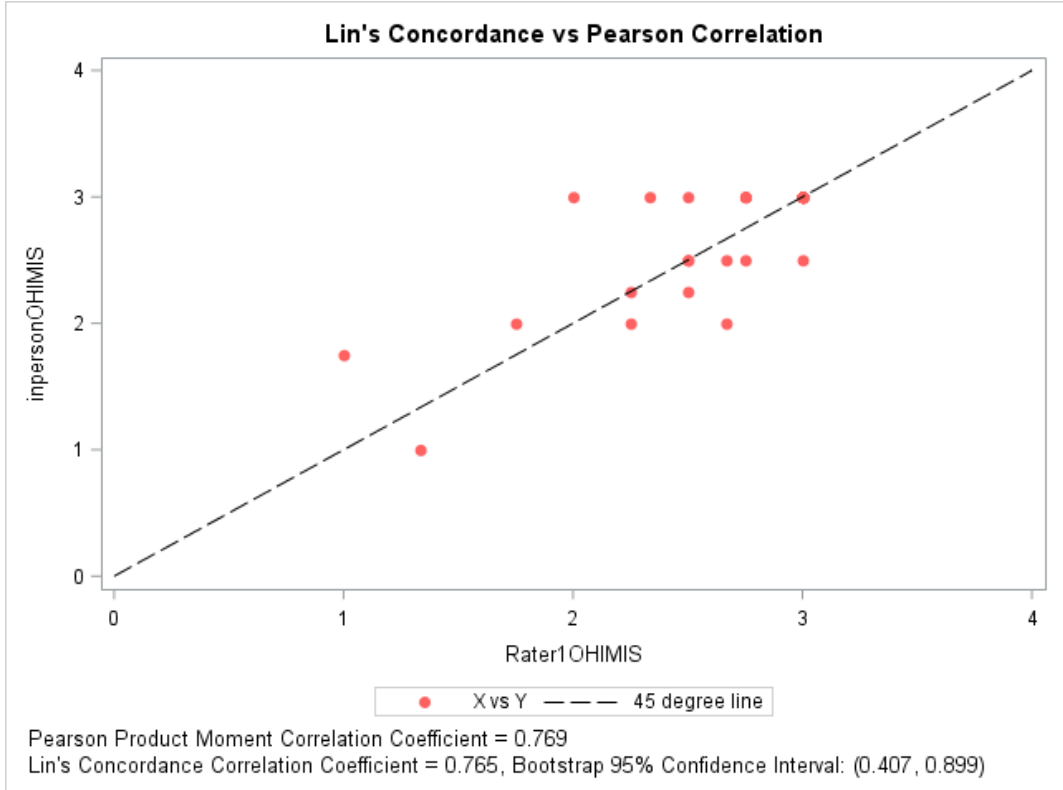
Note: Linear mixed-effects model with a random effect for dyad. Purple text refers to contrasts of each incentive group against the control group. Error bars represent 95% confidence intervals.

S4 Figure. Association between parent-reported episodes per week (in diaries) and app-recorded episodes per week

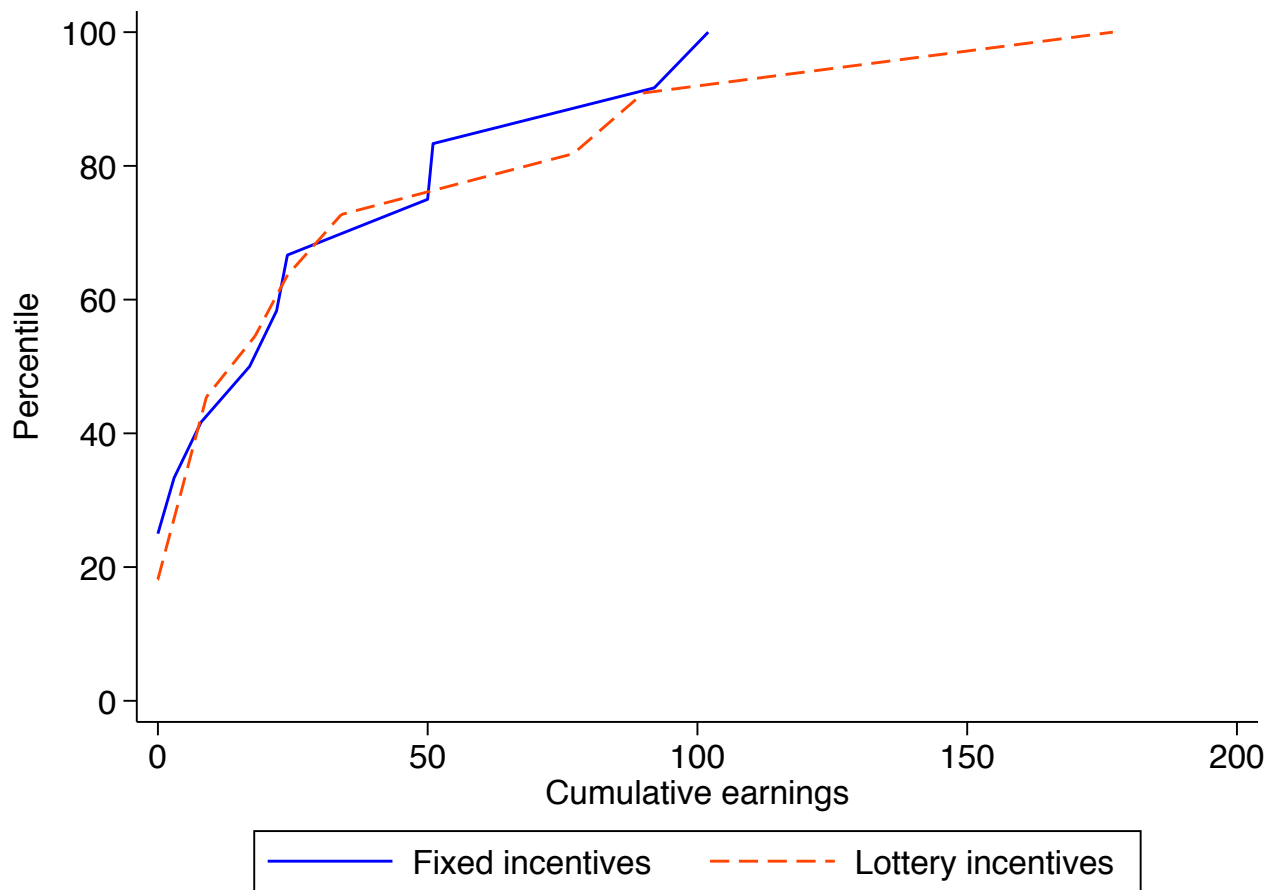


Note: The blue line denotes the regression line,  $AppCount = 4.36 + 0.33DiaryCount$ ,  $R^2 = 0.13$ . Markers are weighted by frequency of observations.

S5 Figure. In-person vs asynchronous plaque rating



S6 Figure. Cumulative distribution of earnings by study group



Note: Mean cumulative earnings was \$30.75 in the fixed incentives group (median \$19.50) and \$39.82 in the lottery incentives group (median \$18.00).



## CONSORT 2010 checklist of information to include when reporting a pilot or feasibility trial\*

Section/Topic	Item No	Checklist item	Reported on page No
<b>Title and abstract</b>			
	1a	Identification as a pilot or feasibility randomised trial in the title	1
	1b	Structured summary of pilot trial design, methods, results, and conclusions (for specific guidance see CONSORT abstract extension for pilot trials)	3-4
<b>Introduction</b>			
Background and objectives	2a	Scientific background and explanation of rationale for future definitive trial, and reasons for randomised pilot trial	4-6
	2b	Specific objectives or research questions for pilot trial	6
<b>Methods</b>			
Trial design	3a	Description of pilot trial design (such as parallel, factorial) including allocation ratio	6-7
	3b	Important changes to methods after pilot trial commencement (such as eligibility criteria), with reasons	7
Participants	4a	Eligibility criteria for participants	7
	4b	Settings and locations where the data were collected	8
	4c	How participants were identified and consented	7, 9
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	9-11
Outcomes	6a	Completely defined prespecified assessments or measurements to address each pilot trial objective specified in 2b, including how and when they were assessed	14-15
	6b	Any changes to pilot trial assessments or measurements after the pilot trial commenced, with reasons	N/A
	6c	If applicable, prespecified criteria used to judge whether, or how, to proceed with future definitive trial	15
Sample size	7a	Rationale for numbers in the pilot trial	16
	7b	When applicable, explanation of any interim analyses and stopping guidelines	N/A
Randomisation:			
Sequence generation	8a	Method used to generate the random allocation sequence	8
	8b	Type of randomisation(s); details of any restriction (such as blocking and block size)	8
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	8

Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	8
Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	8
	11b	If relevant, description of the similarity of interventions	N/A
Statistical methods	12	Methods used to address each pilot trial objective whether qualitative or quantitative	16-18
<b>Results</b>			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were approached and/or assessed for eligibility, randomly assigned, received intended treatment, and were assessed for each objective	Fig 1
	13b	For each group, losses and exclusions after randomisation, together with reasons	Fig 1
Recruitment	14a	Dates defining the periods of recruitment and follow-up	18, Fig 1
	14b	Why the pilot trial ended or was stopped	N/A
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	Table 1
Numbers analysed	16	For each objective, number of participants (denominator) included in each analysis. If relevant, these numbers should be by randomised group	18, Table 2
Outcomes and estimation	17	For each objective, results including expressions of uncertainty (such as 95% confidence interval) for any estimates. If relevant, these results should be by randomised group	Fig 3, Table 2, Fig 5
Ancillary analyses	18	Results of any other analyses performed that could be used to inform the future definitive trial	Fig 4
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	24
	19a	If relevant, other important unintended consequences	N/A
<b>Discussion</b>			
Limitations	20	Pilot trial limitations, addressing sources of potential bias and remaining uncertainty about feasibility	28-29
Generalisability	21	Generalisability (applicability) of pilot trial methods and findings to future definitive trial and other studies	28
Interpretation	22	Interpretation consistent with pilot trial objectives and findings, balancing potential benefits and harms, and considering other relevant evidence	25-28
	22a	Implications for progression from pilot to future definitive trial, including any proposed amendments	25-28
<b>Other information</b>			
Registration	23	Registration number for pilot trial and name of trial registry	4
Protocol	24	Where the pilot trial protocol can be accessed, if available	7
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	Financial Disclosure
	26	Ethical approval or approval by research review committee, confirmed with reference number	7

Citation: Eldridge SM, Chan CL, Campbell MJ, Bond CM, Hopewell S, Thabane L, et al. CONSORT 2010 statement: extension to randomised pilot and feasibility trials. *BMJ*. 2016;355.

\*We strongly recommend reading this statement in conjunction with the CONSORT 2010, extension to randomised pilot and feasibility trials, Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see [www.consort-statement.org](http://www.consort-statement.org).

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