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Example of the full search string used for systematic review in PubMed.

(((((("diabetes mellitus"[MeSH Terms] OR ("diabetes"[All Fields] AND "mellitus"[All Fields]) OR "diabetes mellitus"[All Fields] OR "diabetes"[All Fields] OR "diabetes insipidus"[MeSH Terms] OR ("diabetes"[All Fields] AND "insipidus"[All Fields]) OR "diabetes insipidus"[All Fields]) OR ("prediabetic state"[MeSH Terms] OR ("prediabetic"[All Fields] AND "state"[All Fields]) OR "prediabetic state"[All Fields] OR ("pre"[All Fields] AND "diabetes"[All Fields]) OR "pre diabetes"[All Fields]) OR ("glucose intolerance"[MeSH Terms] OR ("glucose"[All Fields] AND "intolerance"[All Fields]) OR "glucose intolerance"[All Fields] OR ("impaired"[All Fields] AND "glucose"[All Fields] AND "tolerance"[All Fields]) OR "impaired glucose tolerance"[All Fields]) OR (impaired[All Fields] AND ("fasting"[MeSH Terms] OR "fasting"[All Fields]) AND ("glucose"[MeSH Terms] OR "glucose"[All Fields]))) AND (("prevention and control"[Subheading] OR ("prevention"[All Fields] AND "control"[All Fields]) OR "prevention and control"[All Fields] OR "prevention"[All Fields]) OR ("primary prevention"[MeSH Terms] OR ("primary"[All Fields] AND "prevention"[All Fields]) OR "primary prevention"[All Fields]) OR ("life style"[MeSH Terms] OR ("life"[All Fields] AND "style"[All Fields]) OR "life style"[All Fields] OR "lifestyle"[All Fields]) OR ("exercise"[MeSH Terms] OR "exercise"[All Fields] OR ("physical"[All Fields] AND "activity"[All Fields]) OR "physical activity"[All Fields]) OR ("exercise"[MeSH Terms] OR "exercise"[All Fields]) OR ("nutritional status"[MeSH Terms] OR ("nutritional"[All Fields] AND "status"[All Fields]) OR "nutritional status"[All Fields] OR "nutrition"[All Fields] OR "nutritional sciences"[MeSH Terms] OR ("nutritional"[All Fields] AND "sciences"[All Fields]) OR "nutritional sciences"[All Fields]) OR ("diet"[MeSH Terms] OR "diet"[All Fields]))) AND (program[All Fields] OR ("methods"[MeSH Terms] OR "methods"[All Fields] OR "intervention"[All Fields]) OR ("policy"[MeSH Terms] OR "policy"[All Fields]))) AND (("residence characteristics"[MeSH Terms] OR ("residence"[All Fields] AND "characteristics"[All Fields]) OR "residence characteristics"[All Fields] OR "community"[All Fields]) OR (real[All Fields] AND ("life"[MeSH Terms] OR "life"[All Fields])) OR ("translations"[MeSH Terms] OR "translations"[All Fields] OR "translation"[All Fields] OR "protein biosynthesis"[MeSH Terms] OR ("protein"[All Fields] AND "biosynthesis"[All Fields]) OR "protein biosynthesis"[All Fields]) OR effectiveness[All Fields] OR dissemination[All Fields] OR implementation[All Fields])) NOT gestational[All Fields]) NOT (("child"[MeSH Terms] OR "child"[All Fields] OR "children"[All Fields]) OR ("adolescent"[MeSH Terms] OR "adolescent"[All Fields] OR "youth"[All Fields]) OR ("adolescent"[MeSH Terms] OR "adolescent"[All Fields] OR "adolescents"[All Fields]))) NOT (("animals"[MeSH Terms:noexp] OR animal[All Fields]) OR ("rats"[MeSH Terms] OR "rats"[All Fields]) OR ("mice"[MeSH Terms] OR "mice"[All Fields])) AND (("1990/01/01"[PDAT] : "2014/12/31"[PDAT]) AND "humans"[MeSH Terms])

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Supplementary Table S1. Baseline participant characteristics, intervention characteristics, and quality scores by study.

Included in Systematic Review (n=14)													
	Participant Characteristics					Intervention characteristics			Quality item scores				
Author (year) Country	Age (years)	N analyzed	Male %	NHW %	BMI	Sessions	Intervention strategy	Duration (weeks)	Sample	Attrition	Analysis	Report	Quality
Ackermann (2011)(1) US	57.3	36	56	94	31.0	13	Group education by community member	32	2	0	1	2	Low
Amundson (2009)(2) US	53.6	293	20	NR	35.9	22	Group education by healthcare professional	40	2	1	1	0	Low
Coppell (2009)(3) New Zealand	49.6	253	41	0	32.5	Not reported	Group education by community member	104	0	1	1	0	Low
Kaholokula (2012a)(4) US	50.0	72	22	0	40.0	6	Group education by community member	24	1	1	2	2	Med
Kaholokula (2012b)(4) US	49.0	72	8	0	39.0	6	Telephone counseling by community member	24	“	“	“	“	“
Katula (2013)(5) US	57.3	151	42	73	32.9	24	Group education by healthcare professional and community member	96	2	1	2	2	Med
Kramer (2011)(6) US	52.9	81	12	96	37.1	12	Group education by healthcare professional	52	2	2	2	3	High
Oba (2011)(7) Thailand	45.0	160	9	0	24.8	NR	Group education by community member	12	2	2	2	3	High
Piatt (2012)(8) US	54.0	86	15.9	72.7	NR	12	Group education by healthcare professional	12-14	1	0	2	3	Med
Treadwell	NR	42	100	0	N	6	Group education by	6	1	2	1	3	Med

(2010)(9) US					R		community member						
Vojta (2013)(10) US	NR	2369	24	NR	NR	24	Group education by community member	16	1	1	2	4	High
Rowley (2000a)(11) Australia	49	32	25	0	28.5	NR	Group education by community member	104	1	0	1	3	Low
Rowley (2000b)(11) Australia	NR	131	49.3	0	24.5	NA	Community-wide education by community member	208	"	"	"	"	"
Xiao (2013a)(12) US	54.6	59	51.9	77.2	31.8	30	Group education by healthcare professional	12	2	1	1	1	Low
Xiao (2013b)(12) US	51.8	52	54.3	79	31.7	30	Self-directed education via DVDs	12	"	"	"	"	"
Yates (2011a)(13) UK	64.0	22	64	77	29.3	1	Group education by healthcare professional	0	2	1	1	2	Med
Yates (2011b)(13) UK	66.0	22	73.0	91	29.3	1	Group education by healthcare professional plus pedometer	0	"	"	"	"	"
Zyriax (2014)(14) Germany	44.4	55	43	NR	29.8	32	Group education by healthcare professional and community members	52	2	1	1	3	Med
Included in Systematic Review and Meta-Analysis (n=63)													
Author (year) Country	Age (years)	N analyzed	Male %	NHW %	BMI	Sessions	Intervention strategy	Duration (weeks)	Sample	Attrition	Analysis	Report	Total
Absetz (2009)(15) Finland	58.2	266	26.0	0	32.6	6	Group education by healthcare professional	32	1	2	1	2	Med
Ackermann	56.5	46	50.0	93.0	3	16	Group education by	16	2	1	1	3	Med

(2008)(16) US					2.00		community member						
Ackermann (2014a)(17) US	46.5	153	20.0	77.0	--	16	Education via cable TV plus Internet support	26	2	1	2	2	Med
Ackermann (2014b)(17) US	46.9	153	15.0	77.0	--	16	Education via cable TV	26	"	"	"	"	"
Almeida(2010)(18) US	62.4	820	48.0	70.0	29.80	1	Group education by healthcare professional	1	1	2	1	2	Med
Auslander (2002)(19) United States	41.2	138	0.0	0	35.7	12	Group education by community member	12	1	1	1	2	Low
Barclay (2008)(20) UK	62.3	17	33.0	--	29.8	5	Group education by healthcare professional	26	2	2	1	3	High
Benyshek (2013)(21) US	36.9	12	17.0	0	--	16	Group education by community member	16	2	1	1	2	Med
Boltri (2008)(22) US	52.0	8	42.0	0	31.6	16	Group education by healthcare professional	16	1	1	2	3	Med
Boltri (2011)(23) US	57.2	37	30.0	0	33.2	12	Group education by healthcare professional	16	2	2	2	3	High
Costa (2012)(24) Spain	62.0	333	36.0	0	31.2	4	Group education by healthcare professional		2	1	2	3	High
Daniel (1999)(25) Canada	49.1	61	32.0	0	--	--	Group education by community member	70	0	1	1	3	Low
Davis-Smith (2007)(26)	55.9	10	30.0	0.0	35.	6	Group education by healthcare professional	6	1	2	1	4	High

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Duijzer (2014)(27) Netherlands	54.1	24	48.0	--	29.0	47	Group education by healthcare professional	40	0	2	1	3	Med
Dunbar (2014)(28) Australia	61.3	3114	34.0	--	39.1	6	Group education by community member	35	1	2	1	4	High
Endevelt (2015)(29) Israel	51.9	111	52.3	--	29.8	58	Group education by healthcare professional	24	2	0	1	2	Low
Estabrooks (2008)(30) US	57.8	28	28.2	69.0	-	12	Counseling via interactive voice response call	12	0	1	1	2	Low
Faghri (2014a)(31) US	42.3	19	10.5	36.8	38.5	1	Group education by healthcare professional, plus cash award	16	2	1	2	2	Med
Faghri (2014b)(31) US	46.5	16	6.3	43.8	36.9	1	Group education by healthcare professionals, plus matched deposit	16	“	“	“	“	“
Faridi(2010)(32) US	49.0	121	15.0	0.0	33.8	variable	Group education by community member	10	1	1	1	2	Low
Goldfinger (2008)(33) US	68.3	21	19.0	0.0	32.7	8	Group education by community member	10	0	1	1	3	Low
Gutierrez (2014)(34) US	--	159	22.0	0.0	31.7	12	Group education by community member	12	0	1	1	4	Med
Guyse (2011)(35) US	52.6	166	20.0	--	36.7	16	Group education by healthcare professional	16	2	1	1	2	Med
Greaves (2008)(36) UK	53.0	72	36.0	--	--	11	Individual counseling by healthcare professional	26	1	1	2	3	Med
Islam	61.0	21	32	0	2	6	Group education by	26	2	1	1	3	Med

(2013)(37) US					4.5		community member						
Islam (2014)(38) US	46.3	59	4.0	0.0	27.8	6	Group education by community member	26	2	1	1	3	Med
Jaber (2011)(39) US	47.0	71	38.0	0.0	34.3	12	Group education by healthcare professional	24	1	1	2	2	Med
Janus (2012)(40) Australia	64.2	38	17.0	100.0	31.4	6	Group education by healthcare professional	35	2	1	1	2	Med
Jiang (2013)(41) US	46.6	1503	25.5	0.0	35.8	16	Group education by healthcare professional	16	1	1	1	3	Med
Katula (2011) (42) US	57.3	151	43.0	73.5	32.8	26	Group education by community member	26	2	2	2	2	High
Kanaya (2012)(43) US	58.0	113	27.0	20.0	30.1	19	Group education by community member	26	2	2	2	3	High
Kramer (2009)(44) US	57.2	42	21.0	100.0	34.6	12	Group education by healthcare professional	19	2	1	2	3	High
Kramer (2013)(45) US	32.7	18	0.0	0.0	31.4	12	Group education by healthcare professional	15	1	1	1	3	Med
Kramer (2014)(46) US	53.0	52	12.0	96.0	36.7	21	Group education by healthcare professional	12	2	1	1	2	Med
Ma (2013a)(47) US	54.6	79	51.9	77.2	31.8	12	Group education by healthcare professional	12	2	1	2	2	Med
Ma (2013b)(47) US	51.8	81	44.3	79.0	31.7	24	Education via DVD at home	12	“	“	“	“	“

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Makrilakis (2010)(48) Greece	56.0	125	40.0	--	32.0	6	Group education by healthcare professional	52	2	1	1	3	Med
McNabb (1997)(49) US	56.5	15	0.0	0.0	33.9	14	Group education by community member	14	0	2	1	3	Med
Nilsen (2011)(50) Norway	47.0	93	47.0	--	35.9	10	Group education by healthcare professional	16	2	2	1	2	Med
Ockene (2012)(51) US	52.0	162	28.0	0.0	33.6	16	Group education by community member	52	2	2	1	4	High
Pagoto (2008)(52) US	48.7	55	28.0	90.7	43.3	16	Group education by healthcare professional	16	0	2	2	4	High
Payne (2008)(53) Australia	52.6	122	22.0	--	35.0	6	Group education by healthcare professional	18	2	0	2	3	Med
Parikh (2010)(54) US	46.0	35	14.0	2.0	32.0	8	Group education by community member	10	1	1	2	1	Low
Penn (2011)(55) UK	53.7	116	30.0	--	33.9	20	Group education by community member	10	2	1	1	3	Med
Penn (2013)(56) UK	54.3	134	30.0	--	33.5	20	Group education by community member	10	2	1	1	3	Med
Piatt (2013a)(57) US	51.0	96	12.0	100.0	37.0	12	Group education by healthcare professional	12	1	0	1	2	Low
Piatt (2013b)(57) US	52.0	64	15.0	94.0	36.0	12	Education via DVD	12	1	0	1	2	Low
Piatt (2013c)(57) US	49.0	44	12.0	99.0	36.0	12	Education via Internet	12	"	"	"	"	"

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Philis-Tsimikas (2014)(58) US	31.9	70	0.0	0.0	29.1	8	Group education by community member	8	1	2	1	3	Med
Ruggiero (2011)(59) US	37.9	57	7.2	0.0	31.2	16	Group education by community member	16	1	2	1	3	Med
Saaristo (2010)(60) Finland	55.0	2798	33.0	--	31.2	8	Group education by healthcare professional	52	2	1	1	3	Med
Seidel (2008)(61) US	54.0	86	15.9	72.7	36.2	12	Group education by healthcare professional	12	1	0	2	3	Med
Sepah (2014)(62) US	45.3	144	14.6	50.4	36.2	16	Education and counseling by telehealth	16	2	1	1	2	Med
Simmons (1998)(63) New Zealand	37.0	50	34.0	0.0	31.2	160	Group education by community member	104	0	1	1	3	Low
Simmons (2004)(64) New Zealand	33.0	104	48.0	0.0	--	160	Group education by community member	104	0	0	1	3	Low
Simmons (2008)(65) New Zealand	47.0	106	34.4	0.0	34.1	--	Group education by community member	27	1	0	1	4	Med
Sulaiman (2013)(66) Australia	--	94	26.0	--	30.3	2	Group education by community member	1	2	2	2	0	Med
Thompson (2008)(67) US	29.6	64	0.0	0.0	29.5	5	Group education by community member	22	0	1	2	3	Med
Vadheim (2010)(68) US	50.5	65	12.0	92.5	36.2	16	Group education by healthcare professional	16	2	1	1	3	Med
Vadheim (2010a)(69) US	53.0	13	31.0	--	34.0	16	Group education by community member	16	2	2	1	3	High

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Vadheim (2010b)(69) US	50.0	14	7.0	--	38.7	16	Education and counseling by telehealth	16	"	"	"	"	"
Vanderwood (2010)(70) US	52.3	578	20.0	92.5	35.1	16	Group education by a healthcare professional	16	2	1	1	2	Med
Vermunt (2012)(71) Netherlands	--	368	--	--	29.0	17	Group education by healthcare professional	130	2	2	1	3	High
Vincent (2014)(72) US	50.0	38	23.7	0	34.6	8	Group education by community member	8	2	1	1	2	Med
Watanabe (2007)(73) Japan	50.7	117	7.0	0.0	24.5	4	Individual counseling by a healthcare professional	16	1	2	1	2	Med
Wilson (2015)(74) US	49.6	335	19.0	0.0	--	12	Group education by community member	12	0	2	1	3	Med
Whittemore (2009)(75) US	48.2	31	10.0	48.0	40.0	11	Individual counseling by a healthcare professional	24	1	1	2	3	Med
Yates (2009a)(76) UK	66.0	29	69.0	86.0	28.7	1	Group education by healthcare professionals, with pedometer	1	2	1	1	2	Med
Yates (2009b)(76) UK	64.0	29	69.0	39.0	29.5	1	Group education by healthcare professional	"	"	"	"	"	"
Yeary (2011)(77) US	50.8	22	15.0	0.0	35.0	16	Group education by community member	16	1	2	1	3	Med

*If a study presented more than two intervention groups, then the study is listed twice with a letter (a, b or c) to designate the group.
NHW = non-Hispanic white

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SUPPLEMENTARY DATA

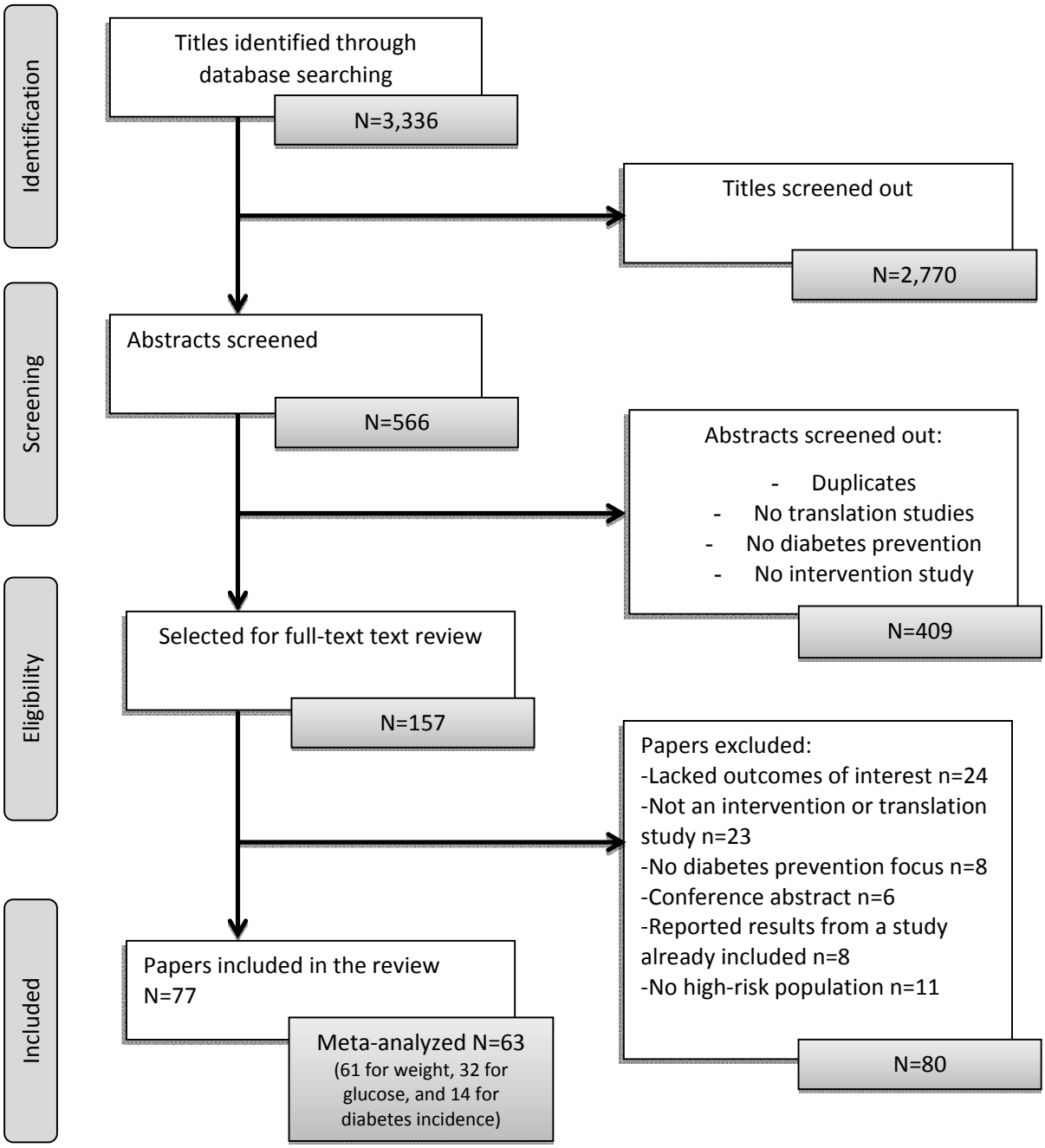
Supplementary Table S2. Subgroup analyses exploring weight, fasting blood glucose, and diabetes incidence by participant characteristics.

	Weight* (change in kg [95% CI])	**Fasting blood glucose† (change in mmol/L [95% CI])**	**Diabetes incidence‡ (odds ratio [95% CI])**
Age	N=61	N=29	N=14
<50	-2.0 [-3.1, -0.9]	-0.13 [-0.10, 0.37]	0.84 [0.43, 1.66]
≥50	-2.7 [-3.4, -2.0]	-0.16 [-0.23, -0.08]	0.65 [0.48, 0.87]
Gender	N=59	N=29	N=14
Mostly female (>60%)	-2.4 [-3.0, -1.8]	-0.11 [-0.22, -0.00]	0.61 [0.43, 0.86]
Mixed gender	-2.2 [-4.4, -0.1]	-0.08 [-0.21, 0.05]	0.77 [0.52, 1.14]
Ethnicity	N=42	N=29	N=14
African American	-1.9 [-3.1, -0.7]	-0.43 [-0.58, -0.28]	------
Asian	-1.3 [-2.2, -0.3]	-0.26 [-0.53, 0.02]	------
Hispanic	-1.2 [-2.1, -0.3]	0.15 [-0.21, 0.52]	0.79 [0.37, 1.67]
Pacific Islander/ Indigenous	-1.0 [-3.4, 1.4]	------	------
White/European	-3.5 [-4.6, -2.4]	-0.09 [-0.18, 0.00]	0.65 [0.48, 0.87]
Prediabetes %	N=26	N=13	N=9
<50% Prediabetic	-3.1 [-4.7, -1.5]	-0.03 [-0.23, 0.30]	0.60 [0.42, 0.87]
≥50% Prediabetic	-2.4 [-3.4, -1.4]	-0.20 [-0.31, -0.08]	0.38 [0.12, 1.19]
Baseline BMI	N=56	N=29	N=14
<30 kg/m^2	-1.1 [-1.8, -0.4]	-0.14 [-0.28, -0.00]	0.79 [0.52, 1.21]
≥30 kg/m^2	-2.9 [-3.5, -2.3]	-0.06 [-0.18, 0.06]	0.61 [0.44, 0.85]

*Pre-post mean change in weight within participants receiving the intervention.
†Pre-post mean change in fasting blood glucose within participants receiving the intervention.
‡Odds of developing diabetes among intervention arms compared to control arms.
N=Number of studies included in the subgroup analyses.

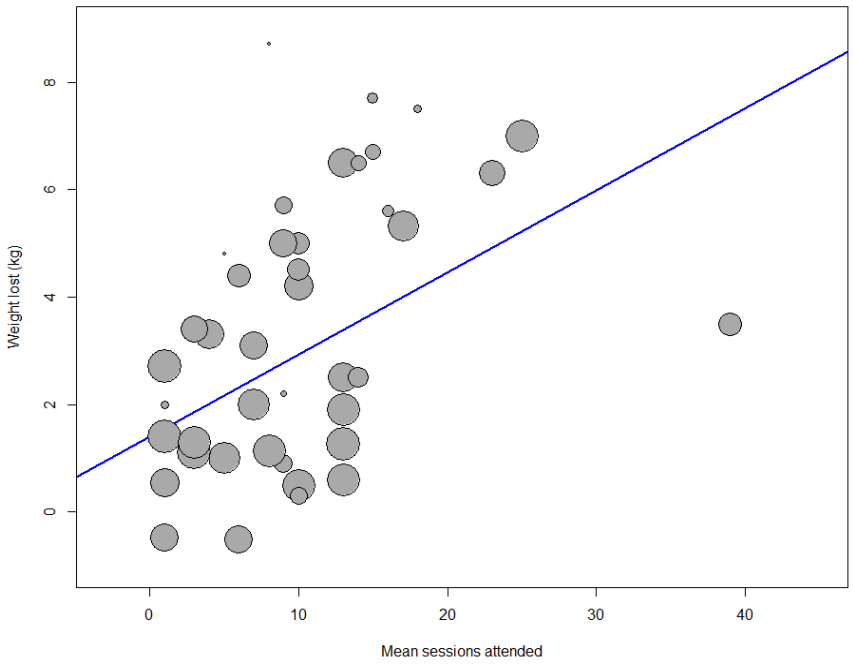
SUPPLEMENTARY DATA

Supplementary Figure S1. PRISMA Study identification flow diagram.



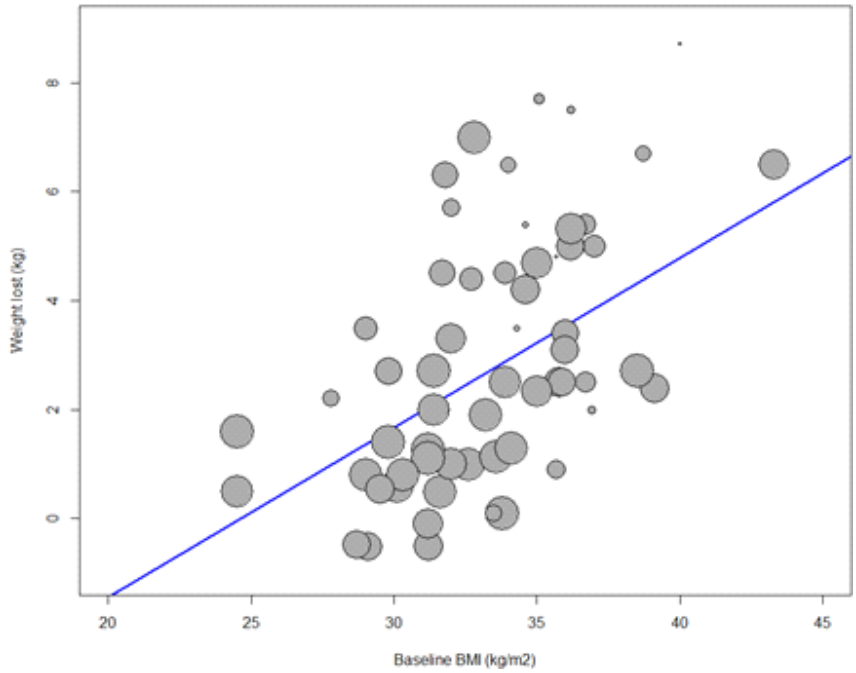
SUPPLEMENTARY DATA

Supplementary Figure S2a. Meta-regression* exploring the association between number of intervention sessions attended and weight loss across studies.



SUPPLEMENTARY DATA

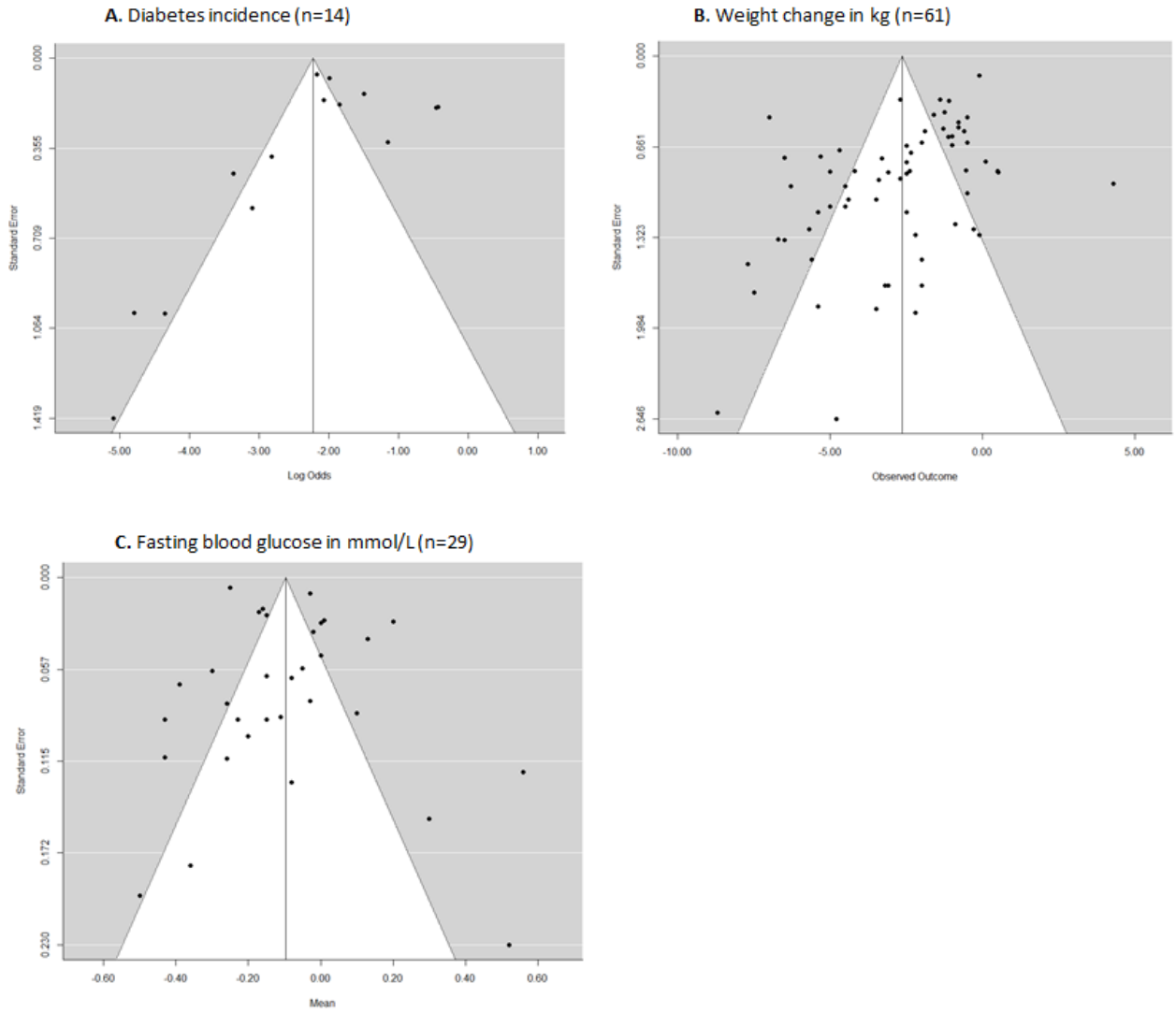
Supplementary Figure S2b. Meta-regression[†] exploring the association between participant baseline BMI and weight loss across studies.



*Meta-regression including number of sessions attended as predictor of weight loss across studies; every additional session participants attended is associated with a weight loss of 0·15 kg (β=0·15, p<0·0001).
[†]Meta-regression including baseline BMI as predictor of weight loss across studies; every BMI point increase is associated with a weight loss of 0·37 kg (β=0·37, p<·001).

SUPPLEMENTARY DATA

Supplementary Figure S3. Funnel plots assessing publication bias among studies reporting diabetes incidence (panel A), weight (panel B) and FBG (panel C).



Each dot represents a study plotted according to their effect (X axis) and their standard error (Y axis). The asymmetrical plot indicates that smaller studies with null effects are less likely to be published (lower corner in the right side of the funnel) than studies with positive effects (left side of the funnel).