

**Supplemental Material**

**A systematic review of social network interventions in patients with type 2 diabetes**

**Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present**

1	*diabetes mellitus, type 2/ or "type 2 diabet*".tw. or niddm.mp. or t2dm.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	114218	Advanced
2	("social network" or "social support").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	69042	Advanced
3	1 and 2	663	Advanced
4	family relations/ or family conflict/ or intergenerational relations/ or sibling relations/	15431	Advanced
5	family/ or adult children/ or family relations/	73608	Advanced
6	family role/ or family therapy/	7952	Advanced
7	1 and (4 or 5 or 6)	536	Advanced
8	(couple or couples or married or spous* or partner*1 or household or neighbor*1).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	231588	Advanced
9	(church* or religious* or husband* or wife* or relatives or "family based").mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept	110536	Advanced

	word, rare disease supplementary concept word, unique identifier]		
10	1 and 8	749	Advanced
11	1 and 9	1089	Advanced
12	7 or 10 or 11	2151	Advanced
13	limit 12 to randomized controlled trial	87	Advanced
14	12 and intervention*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	290	Advanced
15	12 and (behavior* or behaviour* or adher* or education* or aware* or stigma*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	573	Advanced
16	13 or 14	330	Advanced
17	3 or 7 or 12	2695	Advanced
18	intervention*.mp. and 17 [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	512	Advanced
19	13 or 18	552	Advanced

20	17 and random*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	338	Advanced
21	19 or 20	676	Advanced
22	remove duplicates from 21	665	

CENTRAL – same strategy – 205

Embase 1988 to 2017 Week 16			
#	Searches	Results	Search Type
1	*diabetes mellitus, type 2/ or "type 2 diabet*".tw. or niddm.mp. or t2dm.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	142471	Advanced
2	("social network" or "social support").mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	79400	Advanced
3	1 and 2	645	Advanced
4	family relations/ or family conflict/ or intergenerational relations/ or sibling relations/	69298	Advanced

5	family/ or adult children/ or family relations/	70584	Advanced
6	family role/ or family therapy/	8709	Advanced
7	1 and (4 or 5 or 6)	439	Advanced
8	(couple or couples or married or spous* or partner*1 or household or neighbor*1).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	265365	Advanced
9	(church* or religious* or husband* or wife* or relatives or "family based").mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	109824	Advanced
10	1 and 8	1041	Advanced
11	1 and 9	1305	Advanced
12	7 or 10 or 11	2620	Advanced
13	3 or 12	3134	Advanced
14	13 and intervention*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	653	Advanced
15	randomized controlled trial/	376080	Advanced
16	13 and 15	158	Advanced

17	13 and random*.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	410	Advanced
18	14 or 16 or 17	847	Advanced
19	limit 18 to human	796	Advanced
20	non insulin dependent diabetes mellitus/	166150	Advanced
21	19 and 20	665	

**PsycINFO** 1987 to April Week 2 2017

#	Searches	Results	Search Type
1	diabetes mellitus/	4189	Advanced
2	1 and ("type 2" or noninsulin* or "non insulin" or niddm or t2d or t2dm).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	1815	Advanced
3	exp social support/	26965	Advanced
4	social networks/ or exp social groups/ or exp social interaction/ or exp social support/ or exp support groups/	276211	Advanced
5	2 and (3 or 4)	90	Advanced

6	exp Family Therapy/ or family.mp. or exp Family Relations/ or exp Family/ or exp Family Systems Theory/ or exp Family Structure/	282330	Advanced
7	couples/ or cohabitation/ or dyads/ or significant others/ or exp spouses/	25371	Advanced
8	2 and (6 or 7)	195	Advanced
9	5 or 8	258	Advanced
10	limit 9 to ("0830 systematic review" or 1200 meta analysis)	1	Advanced
11	9 and (intervention* or random*).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]	78	Advanced
12	10 or 11	79	Advanced
13	limit 12 to all journals	55	

#### CINAHL

#	Query	Limiters/Expanders	Last Run Via	Results
S12	S8 AND S11	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	9
S11	S5 AND S10	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	78
S10	(MH "Family+") OR (MH "Family Relations+") OR (MH "Patient-Family	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search	123,032

	Relations") OR (MH "Nuclear Family+") OR (MH "Family Attitudes+")		Database - CINAHL with Full Text	
S9	S5 AND S8	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	75
S8	S6 OR S7	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	129,321
S7	(MH "Intervention Trials") OR "intervention"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	111,076
S6	(MH "Randomized Controlled Trials")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	25,142
S5	S1 AND S4	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	385
S4	S2 OR S3	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	48,947
S3	(MH "Young Adult Social Support Index") OR (MH "Social Support Index") OR (MH "Social Support (Iowa NOC)") OR (MH "Norbeck Social Support Questionnaire")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	289
S2	(MH "Social Networks") OR (MH "Social Network Analysis (Saba CCC)") OR (MH "Support, Psychosocial+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	48,840
S1	(MH "Diabetes Mellitus, Type 2")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text	26,607

Supplement Table S1. Search strategy



Study	Notable inclusion criteria	Intervention			Control		
		N	Mean Age in years (SD)	Mean duration of T2DM in years (SD)	N	Mean Age in years (SD)	Mean duration of T2DM in years (SD)
Wing 1991	>20% above ideal above weight	25	53.6 (7.7)	NR	24	51.2 (7.3)	NR
Brown 2002	None	128	54.7 (8.2)	7.6 (5.8)	128	53.3 (8.3)	8.1 (6.9)
Sammuel - Hodge 2002	A1C>8%	117	57 (9.7)	9 (NR)	84	61.3 (11.9)	11 (NR)
Pearce 2008	No history of ketoacidosis	108	61.2 (10.59)	NR	91	63.1 (8.63)	NR
Kang 2010	At least two of last three A1C reading $\geq$ 7%; used oral antidiabetic agents only	33	55.3 (7.7)	3.8 (3.2)	34	51.7 (8.5)	4.4 (3)
Toobert 2011	2 out of 3 LAST A1Cs $>$ 8%	142	55.6 (9.7)	8.4 (6.5)	138	58.7 (10.3)	10.4 (9.8)
Greene 2015	Latinas	21	NR	NR	27	NR	NR
Keogh 2011	Married for $>$ 1 year; A1C $>$ 7.3%	60	59.96 (11.67)	9.17 (7.1)	61	57.9 (11.34)	9.65 (6.45)
Trief 2011	$>$ 60 years old; Mexican American; documented difficulties with health habits	12	60.33 (8.63)	8.63 (NR)	12	61.08 (9.27)	9.27 (NR)
Haltiwanger 2012	$>$ 30 years old; medium or low adherence; low social support	12	NR	NR	36	NR	NR
Khosravizade 2014	A1C $>$ 7% or FBS $>$ 110mg/dl	45	52.93 (7.62)	9.71 (6.75)	46	54.13 (7.56)	11.39 (5.4)
Shaya 2014	Latina; mother to overweight woman	68	53.9 (NR)	9.2 (8.6)	70	51.9 (NR)	8.8 (8.2)
Sorkin 2014	African American	53	52.7 (6.9)	9.8 (NR)	36	52.7 (6.9)	9.8 (NR)
Baig 2015	Diagnosis of diabetes by a physician	50	51.7 (11.6)	8.7 (8.67)	50	55.7 (11.4)	7.8 (7.14)
Kasteleyn 2015	$>$ 35 years old; within 2 weeks from hospital discharge after first acute coronary event	101	66 (9.3)	7.0 (2.8-16)	100	65.6 (9.4)	8.5 (5-15)
Trief 2016	Married or with partner for $>$ 1 year; A1C $>$ 7.5%	97	57.8 (10.8)	12.8 (8.5)	78	56.9 (10.4)	12.6 (8.3)
McEwen 2017	Mexican American	83	53.64 (9.6)	11.92	74	53.41 (8.4)	11.05
Samuel-Hodge 2017	African American; overweight or obese; A1C $\leq$ 11%	36	54.6 (10.55)	7.3 (NR)	18	52.8 (8.56)	5.4 (NR)
Wichit 2017	$\geq$ 35 years old; T2DM duration of $\geq$ 6 months and living in Thachang District, Thailand	70	61.3 (11.6)	6.0 (4.7) 6.0 (4.7)	70	55.5 (10.5)	5.4 (4.3)

Supplemental Table S2. Trial inclusion criteria and participant baseline characteristics

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Baig 2015	?	?	-	?	-	+	?
Brown 2002	?	?	-	+	+	+	?
Greene 2015	?	?	-	?	?	?	?
Haltiwanger 2012	+	?	-	?	-	-	?
Kang 2010	+	?	-	?	+	+	?
Kasteleyn 2014	+	?	-	?	+	+	?
Keogh 2011	+	+	-	+	+	-	?
Khosrazivade 2014	?	?	-	?	+	?	?
McEwen 2017	+	+	-	-	-	-	?
Pearce 2008	+	+	-	?	?	-	?
Samuel-Hodge 2009	+	+	-	+	-	+	?
Samuel-Hodge 2017	+	?	-	+	+	+	?
Shaya 2014	-	?	-	?	-	+	?
Sorkin 2014	+	+	-	?	+	+	?
Toobert 2011	?	+	-	+	+	+	?
Trief 2011	?	?	-	+	-	+	?
Trief 2016	+	+	-	+	-	-	-
Wichit 2017	+	-	-	+	+	+	?
Wing 1991	?	?	-	?	+	?	?

Supplemental Figure S1. Risk of bias of included trials (Cochrane risk of bias tool)

Assessing confidence in the estimates of effect:  
GRADE

Quality assessment							N <sup>o</sup> of patients		Effect	Quality	Importance
N <sup>o</sup> of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Social network interventions	Any comparator	Absolute (95% CI)		
Social Support											
8	randomised trials	serious <sup>1</sup>	serious <sup>2,3</sup>	not serious	serious <sup>4</sup>	strong association	515	471	SMD 0.74 <b>higher</b> (0.32 higher to 1.15 higher)	Low to moderate	IMPORTANT

CI: Confidence interval; SMD: Standardised mean difference

1. unclear blinding of outcome assessors
2. I<sup>2</sup>=90%
3. non-overlapping CIs
4. confidence interval or estimate effect includes non-important change as well as very important change

Quality assessment							N <sup>o</sup> of patients		Effect	Quality	Importance
N <sup>o</sup> of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Social network interventions	Any comparator	Absolute (95% CI)		
HbA1c: 3 months											
9	randomised trials	serious <sup>1</sup>	not serious	not serious	not serious	none	554	527	MD 0.25 <b>lower</b> (0.40 lower to 0.11 lower)	Low to very low	IMPORTANT
HbA1c: 5-7 Months											
11	randomised trials	serious <sup>1</sup>	serious <sup>2</sup>	not serious	not serious	none	777	727	MD 0.24 <b>lower</b> (0.52 lower to 0.03 higher)	Low to very low	IMPORTANT

Quality assessment							N <sup>o</sup> of patients		Effect	Quality	Importance
N <sup>o</sup> of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Social network interventions	Any comparator	Absolute (95% CI)		
HbA1c: 8+ months											
3	randomised trials	serious <sup>1</sup>	very serious <sup>2</sup>	not serious	serious <sup>3</sup>	none	355	319	MD <b>0.1 lower</b> (0.84 lower to 0.65 higher)	Low to very low	IMPORTANT
HbA1c: Longest follow-up											
17	randomised trials	serious <sub>1</sub>	not serious	not serious	not serious	none	1134	1048	MD <b>0.16 lower</b> (0.32 lower to 0)	Low to very low	IMPORTANT

CI: Confidence interval; MD: Mean difference

1. unclear allocation concealment
2. high I2
3. large CI

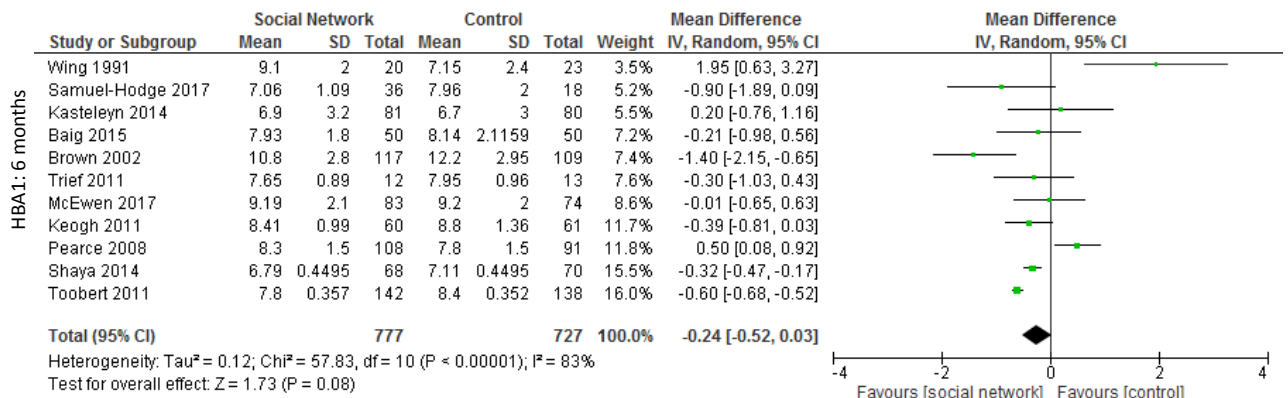
Quality assessment							N <sup>o</sup> of patients		Effect	Quality	Importance
N <sup>o</sup> of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Social network interventions	Any comparator	Absolute (95% CI)		
Well-being											
2	randomised trials	serious <sup>1</sup>	very serious <sup>2,3</sup>	not serious	very serious <sup>4</sup>	none	141	141	SMD <b>0.62 higher</b> (0.13 lower to 1.37 higher)	Low to very low	IMPORTANT
Quality of Life: Physical Component											
4	randomised trials	serious <sup>1</sup>	not serious	not serious	not serious	none	284	240	SMD <b>0.06 higher</b> (0.11 lower to 0.23 higher)	Low to very low	IMPORTANT
Quality of Life: Mental Component											

Quality assessment							N° of patients		Effect	Quality	Importance
N° of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Social network interventions	Any comparator	Absolute (95% CI)		
4	randomised trials	serious <sup>1</sup>	not serious	not serious	not serious	none	284	240	<b>SMD 0.01 lower</b> (0.18 lower to 0.20 higher)	Low to very low	IMPORTANT

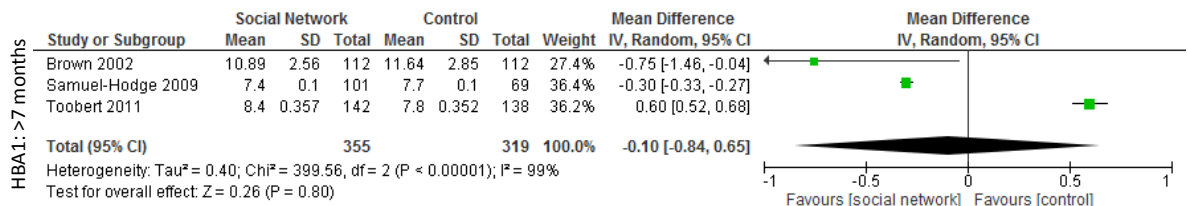
CI: Confidence interval; SMD: Standardised mean difference

1. unclear allocation concealment
2. high I2
3. differences in scales used
4. very wide CI

### Supplemental Table S3. GRADE assessment



### Supplemental Figure S2. Effect of social network intervention on HbA1c at 6 months follow-up



### Supplemental Figure S3. Effect of social network intervention on HbA1c at 8+ months follow-up

## Subgroup Analyses

	Hba1c at last follow-up			Social support at last follow-up		
	<b>Subgroup</b> <i>effect size (95% CI); I<sup>2</sup></i>	<b>Comparison subgroup</b> <i>effect size (95% CI); I<sup>2</sup></i>	<b>P-value for interaction</b>	<b>Subgroup</b> <i>effect size (95% CI); I<sup>2</sup></i>	<b>Comparison subgroup</b> <i>effect size (95% CI); I<sup>2</sup></i>	<b>P-value for interaction</b>
<b>Patient characteristics</b>						
Mean baseline HbA1c > 8%	-0.08 (-0.38, 0.23); 62%	-0.28 (-0.40, -0.16); 0%	0.22	0.89 (0.39, 1.38); 90%	0.26 (-0.30, 0.82); 65%	0.10
<b>Intervention characteristics</b>						
Self-selected social network	-0.20 (-0.41, 0.02); 59%	-0.14 (-0.35, 0.06); 0%	0.73	0.77 (0.29, 1.24); 91%	0.56 (0.13, 1.0); NA	0.54
Household member	-0.07 (-0.29, 0.014); 47%	-0.32 (-0.45, -0.19); 0%	0.05	0.96 (0.36, 1.55); 92%	0.35 (-0.05, 0.76); 63%	0.10
Contact time >585 minutes	-0.17 (-0.38, 0.04); 5%	-0.34 (-0.59, -0.09); 0%	0.30	0.32 (-0.03, 0.68); 27%	0.82 (0.18, 1.47); 73%	0.18
Underlying framework	-0.25 (-0.36, -0.15); 1%	-0.11 (-0.63, 0.4); 76%	0.60	0.34 (0.11, 0.57); 43%	1.39 (0.32, 2.47); 94%	0.06
Dyadic social network reported	-0.21 (-0.38, -0.04); 9%	-0.07 (-0.41, 0.27); 77%	0.46	1.05 (0.38, 1.72); 89%	0.30 (-0.08, 0.67); 79%	0.05
<b>Trial characteristics</b>						
Low risk of bias	-0.18 (-0.49, 0.12); 67%	-0.25 (-0.38, -0.13); 0%	0.66	0.59 (0.42, 0.76); 0%	0.94 (-0.03, 1.90); 95%	0.49

Supplemental Table S4. Subgroup analyses