Online Appendix 1 Search strategy

CENTRAL search (2007, updated 2009)

- 1 MeSH descriptor Diabetes Mellitus explode all trees
- 2 (diabet*):ti,ab,kw in Clinical Trials
- 3 (1 OR 2)
- 4 "Diabetic Coma":kw in Clinical Trials
- 5 "Diabetic Foot":kw
- 6 "Diabetic Hypertension":kw
- 7 "Diabetic Ketoacidosis":kw
- 8 "Diabetic Macular Edema":kw
- 9 "Diabetic Nephropathy":kw
- 10 "Diabetic Neuropathy":kw
- 11 "Diabetic Obesity":kw
- 12 "Diabetic Retinopathy":kw
- 13 "Impaired Glucose Tolerance":kw
- 14 "Insulin Dependent Diabetes Mellitus":kw
- 15 "Juvenile Diabetes Mellitus":kw
- 16 "Non Insulin Dependent Diabetes Mellitus":kw
- 17 (4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16)
- 18 (3 OR 17)

Embase search for recent studies not included in CENTRAL (2006 - 2009)

- 1. exp Diabetes Mellitus/
- 2. randomized controlled trial/
- 3. crossover procedure/
- 4. double blind procedure/
- 5. single blind procedure/
- 6. or/2-5
- 7. 1 and 6
- 8. limit 7 to human
- 9. limit 8 to yr="2006 2007"

Medline search for recent studies not included in CENTRAL (2006 – 2009)

- 1. exp Diabetes Mellitus/
- 2. randomized controlled trial.pt.
- 3. controlled clinical trial.pt.
- 4. 2 or 3
- 5. 1 and 4
- 6. limit 5 to humans
- 7. limit 6 to yr="2006 2007"

Psychinfo search (1985 to 2009)

1. exp Diabetes/

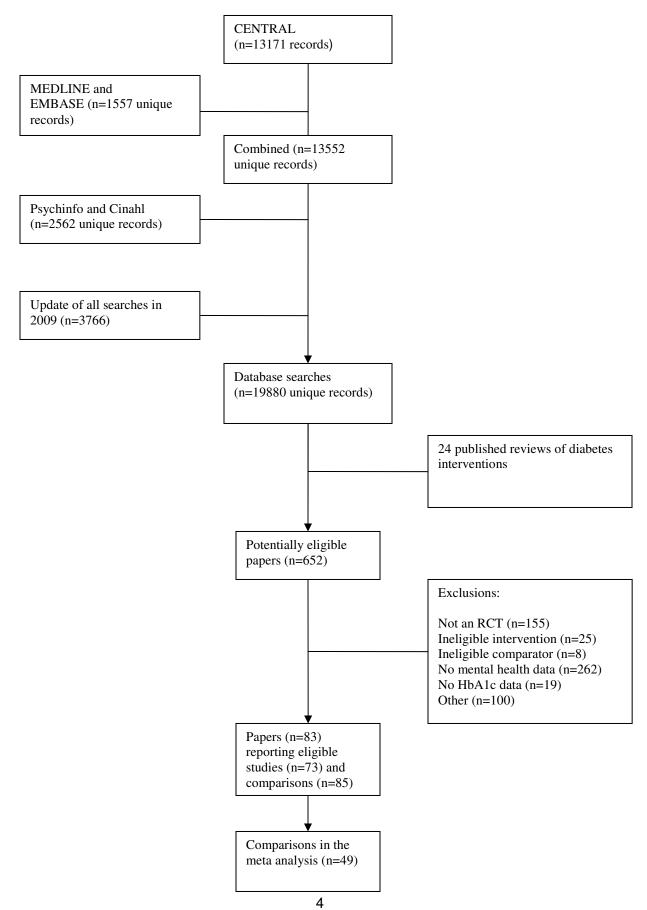
- 2. Diabetes.tw.
- 3. or/1-2

- 4. Randomi?ed controlled trial\$.tw.
 5. Controlled clinical trial\$.tw.
 6. "2000".md.
 7. or/4-6
 8. (animal not human).po.
 9. 7 not 8
 10. (clin\$ adj25 trial\$).tw.
 11. ((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$)).tw.
 12. placebo\$.tw.
 13. random\$.tw.
 14. or/10-13
 15. 14 not 8
 16. 15 not 9
- 17. 3 and (9 or 16)

Cinahl search (1980 – 2009)

- 1. Diabetes.hw.
- 2. Glycemic Control/
- 3. Diabetes.tw.
- 4. or/1-3
- 5. exp Clinical Trials/
- 6. Clinical Trial.pt.
- 7. Randomi?ed controlled trial\$.tw.
- 8. Controlled clinical trial\$.tw.
- 9. or/5-8
- 10. Random assignment/
- 11. Random\$.tw.
- 12. (clin\$ adj25 trial\$).ti,ab.
- 13. ((singl\$ or doubl\$ or trebl\$ or tripl\$) adj25 (blind\$ or mask\$)).ti,ab.
- 14. Placebos.sh.
- 15. placebo\$.tw.
- 16. or/10-15
- 17.16 not 9
- 18. 4 and (9 or 17)

Online Appendix Figure 1 PRISMA flowchart



©2009 American Diabetes Association. Published online at http://care.diabetesjournals.org/cgi/content/full/dc09-1519/DC1

Characteristic	Subcategories	N (%) or Mean (SD)(range)
Type of diabetes	Туре 1	13 (27)
	Type 2	27 (55)
	Combined	9 (18)
Age	Mean age <18	3 (6)
	Mean age >50	31 (63)
	Mixed	13 (27)
	Unclear	2 (4)
Diabetic control	Recruited on the basis of poor control	11 (22)
Mental health	Recruited on the basis of baseline depression	5 (10)
Professional	Mental health	13 (27)
delivering the intervention*	Behaviour change	14 (29)
	Diabetes specialist	11 (22)
	Peers with diabetes	5 (10)
Setting of delivery**	Community	10 (20)
actively	Primary care	13 (27)
	Specialist	27 (55)
	Not clear	3 (6)
Delivery	Face to face individual	14 (29)
	Face to face group	15 (31)
	Remote individual	5 (10)
	Remote group	0 (0)
	Combination	15 (31)
Components		1.9 (1.0) 1 to 5
Number of sessions		11.1 (9.2) 1 to 36
Total time (hours)		15.1 (20.4) 0.5 to 110

Online Appendix Table 1 Descriptive data on populations, interventions and quality

Duration of delivery (months)		5.24 (5.2) 0.04 to 24
Quality of delivery	Training	18 (37)
	Supervision	6 (12)
	Use of a treatment manual	12 (24)
	Assessments of adherence	8 (16)
	Assessment of competence	6 (12)
Lifestyle	Education and skills	22 (45)
interventions	Exercise	5 (10)
	Theory based behavioural intervention	16 (33)
	Motivational interviewing	5 (10)
Psychological	СВТ	5 (10)
interventions	Social support and skills training	9 (18)
	Relaxation	8 (16)
	Other psychological therapy	6 (12)
Type of	Lifestyle only	26 (53)
interventions	Psychological only	14 (29)
	Combined	9 (18)
Other	Health professional training	0 (0)
	Collaborative care	5 (10)
	Miscellaneous	11 (22)
Study quality	Adequate sequence generation	13 (27)
	Adequate allocation concealment	11 (22)
	Blinding of outcome assessors	14 (29)
	Intention to treat analysis	19 (39)
	Follow-up > 80%	36 (73)
	Sample size	162 (183) 17-824

*Some interventions used more than one type of professional (n=10), and some included none of the professionals listed

**Percentages add up to more than 100% as some interventions took place in more than one setting (n=4)

Online Appendix Table 2 Characteristics of the interventions

Author	Intervention	Sessions		Duration (months)	Professionals involved in delivery	Lifestyle	Psychological	Other	Delivery mode	Quality assurance
Aikens 1997 (1)	Relaxation training	6.00	6	1.50	Mental health Behaviour change	None	Social support Relaxation	None	Group face to face	Manual
Alam 2004 (2)	Supervised exercise program and supervision	24.00	24	6	Behaviour change	Exercise Motivational interviewing	None	None	Individual face to face	None
Bing 2005 (3)	Diabetes education and psychological intervention	24.00	48	6		Education and skills	None	None	Combined	None
Bond 2007 (4)	Web-based education and skills and social support	26.00	6.5	6		Education and skills TBBI	Social support	None	Combined	None
DAFNE 2002 (5)	Skills training	5.00	35	0.18	Diabetes specialist	Education and skills	None	None	Group face to face	Training Manual Adherence Competence
Davies 2008 (6)	Group education and skills training and goal setting	1.50	6	0.04	Behaviour change	Education and skills TBBI	None	None	Group face to face	Training Manual Adherence
De Wit (7)	Monitoring and discussion of health-related quality of life	3.00	3	12		None	Other psychotherapy	Miscellaneous	Individual face to face	Training Manual

Didjurgeit 2002 (8)	Problem-solving	14.00	12.8	3.50	Mental health	None	CBT	None	Individual face to face	Supervision
George 2008 (9)	Brief educational intervention	3	19	1.5	Diabetes specialist	Education and skills TBBI	None	None	Group face to face	Training Manual Adherence
Gilden 1992 (10)	Education and support	18.00	18	18	Mental health Peer	Education and skills	Social support	None	Group face to face	Training
Glasgow 2006 (11)	Theory based self management	3.00	1.5	1	Behaviour change	Education and skills TBBI Motivational interviewing	None	Collaborative care	Combined	Training
Graue 2005 (12)	Education and counselling	6.00	11.25	12	Mental health Behaviour change Diabetes specialist Peer	Education and skills TBBI Motivational interviewing	Social support	None	Combined	None
Grey 1998 (13)	Coping skills training	12.00	15		Mental health Diabetes specialist	TBBI	Social support	None	Group face to face	Training Adherence
Henry 1997 (14)	Cognitive- behavioural stress management	6.00	9	1.50	Mental health Behaviour change	None	CBT Relaxation	None	Group face to face	None
Huang 2002 (15)	Health education and psychosocial intervention	31.50	79.5	3	Mental health Diabetes specialist	Education and skills	Other psychotherapy	None	Combined	None

Ismail 2008 MET (16)	Motivational Enhancement Therapy	4	3.33	2	Diabetes specialist	Motivational interviewing	None	None	Individual face to face	Training Supervision Manual Adherence Competence
Ismail 2008 MET+CBT (16)	Motivational Enhancement Therapy plus CBT	4	3.33	2	Diabetes specialist	Motivational interviewing TBBI	None	None	Individual face to face	Training Supervision Manual Adherence Competence
Jacobi 2002 mastery (17)	Mastery	6.00	6	1.50	Behaviour change	None	СВТ	Miscellaneous	Group face to face	Supervision Competence
Jacobi 2002 support (17)	Support	6.00	6	1.50	Behaviour change	None	Social support	None	Group face to face	Supervision Competence
Janssen 2009 (18)	Education	9.00	9	12		Education and skills	None	None	Individual face to face	Training
Karlsen 2004 (19)	Group counselling	9.00	13.5	12	Diabetes specialist Peer	Education and skills TBBI	Social support Other psychotherapy	Miscellaneous	Group face to face	Training
Katon 2006 (20,21)	Case management	10.93	6.53	12	Mental health	None	CBT	Collaborative care	Combined	Training Supervision Manual Adherence Competence
Koehler 1981 progressive relaxation (22)	Progressive relaxation	4.00	1	1		None	Relaxation	None	Individual remote	None
Koehler 1981 self-relaxation (22)	Self relaxation	4.00	1	1		None	Relaxation	None	Individual remote	None
Kulzer 2007 self management group (23)	Self management group	12.00	18	3	Behaviour change	TBBI	None	None	Group face to face	Training

Kulzer 2007 self management individual (23)	Self management individual	12.00	18	3	Behaviour change	TBBI	None	None	Combined	Training
Lambers 2008 combination (24)	Strength & endurance training	36	36	3		Exercise	None	None	Individual face to face	None
Lambers 2008 exercise (24)	Exercise training	36	36	3		Exercise	None	None	Individual face to face	None
Ligtenberg 1998 (25)	Physical training programme	21.00	18.75	3		Exercise	None	None	Combined	None
Litaker 2003 (26)	Self management training	12.00	3	12		None	None	Collaborative care	Combined	Training Manual
Lustman 1998 (27)	CBT	10.00	10	2.50	Mental health Behaviour change	None	CBT	None	Individual face to face	None
Ma 2006 (28)	Psycho- intervention	6	6	1.5	Mental health	Education and skills	Relaxation Other psychotherapy	None	Combined	None
Maljanian 2005 (29)	Telephone follow up	12.00	1.40	3		Education and skills	None	None	Individual remote	Manual
McGinnis 2005 (30)	Biofeedback and relaxation	10	7.5	2.5		None	Relaxation	Miscellaneous	Individual face to face	None
McGrady 1999 (31)	Biofeedback and relaxation	12.00	9	3		None	Relaxation	None	Individual face to face	None
O'Kane 2008 (32)	Self monitoring	4	4	12		Education and skills	None	None	Individual face to face	None
Piette 2000 (33)	Automated calls with telephone nurse follow-up	5.60	1.16	12		Education and skills	None	Miscellaneous	Individual remote	None

Pouwer 2001 (34)	Monitoring psychological well-being	2.00	0.50		Diabetes specialist	None	Other psychotherapy	Miscellaneous	Individual face to face	Training
Robertson 2002 (35)	Problem solving	2.00	3.30		Behaviour change	Education and skills TBBI	None	None	Group face to face	None
Rosal 2005 (36)	Self- management	13.00	29		Diabetes specialist	Education and skills TBBI	None	Miscellaneous	Combined	Training Manual
Rost 1991 (37)	Activation and education	1.00	0.75	0.04		TBBI	None	Miscellaneous	Combined	None
Scott 1984 (38)	Diabetes education	4.00	4	1		Education and skills	None	None	Combined	None
Siebolds 2006 (39)	Monitoring and counselling	4.00	0.50	6		TBBI	None	Miscellaneous	Individual face to face	Training Manual
Speiss 1995 (40)	Education plus stress reduction	27.00	39.50	6	Mental health	None	Other psychotherapy	Miscellaneous	Combined	None
Sykes 2004 (41)	Aerobic exercise training	14.00	14	3.50		Education and skills Exercise	None	None	Group face to face	None
Toobert 2007 (42)	Mediterranean lifestyle program	27.00	110		Mental health Behaviour change Peer	Education and skills TBBI	Social support Relaxation	Miscellaneous	Group face to face	None
van der Ven 2005 (43)	Cognitive Behavioural Group Training	6.00	12		Mental health Behaviour change Diabetes specialist	TBBI	None	None	Group face to face	Adherence
Wagner 2001 (44)	Chronic care clinics	5.30	9.28	24	Peer	Education and skills	Social support	Collaborative care	Combined	None

Weinburger	Nurse education	12.00	3	12	Education and	None	Collaborative	Individual	None
1995 (45)	and telephone				skills		care	remote	
	monitoring								

TBBI: Theory based behavioural intervention CBT: Cognitive-behavioural therapy

Online Appendix Table 3 Quality of the studies

Author	Follow up duration	N	Sample characteristics	Context	Sequence generation adequate?	Concealment adequate?	Outcomes blinded?	Intention to treat analysis?	Attrition <20%	Mental health outcome
Aikens 1997 (1)	16 weeks	22	Elderly 59% female Type 2 Poor control	Specialist	No	No	No	No	Yes	Symptom Check List (SCL 90) generalized distress scale
Alam 2004 (2)	6 months	18	Elderly 50% female Type 2 Poor control	Specialist	No	No	No	No	Yes	Well being questionnaire (WBQ) total score
Bing 2005 (3)	6 months	300	Elderly 38% female Type 2	Specialist	No	No	No	No	No	Symptom Check List (SCL 90) depression scale
Bond 2007 (4)	6 months	62	Elderly 45% female Mix	Community	No	No	Yes	Yes	Yes	Centre for Epidemiological Studies Depression Scale (CESD)

DAFNE 2002 (5)	6 months	169	56% female Type 1 Poor control	Specialist	Yes	Yes	No	No	No	Well being questionnaire (WBQ 12) total wellbeing score
Davies 2008 (6)	8 months	824	Elderly 45% female Type 2	Primary care	Yes	Yes	No	Yes	No	WHO WHOQOL- BREF psychological scale
De Wit 2008 (7)	12 months	91	Children 47% female Type 1	Specialist	No	No	No	Yes	Yes	Centre for Epidemiological Studies Depression Scale (CESD)
Didjurgeit 2002 (8)	6 months	46	61% female Type 1	Specialist	No	No	Yes	Yes	Yes	Symptom Check List (SCL 90)
George 2008 (9)	6 months	114	55% female Type 1	Specialist	No	Yes	No	Yes	Yes	Short Form 36 mental health scale
Gilden 1992 (10)	24 months		Elderly 100% male Mix	Specialist	No	No	No	No	Yes	Zung Depression Scale
Glasgow 2006 (11)	2 months	400	Elderly 50% female Type 2	Primary care	No	No	No	Yes	No	Patient Health Questionnaire (PHQ 9)
Graue 2005 (12)	15 months	101	Children 46% female Type 1	Specialist	No	No	No	No	Yes	Child Health Questionnaire (CHQ-CF8) mental health scale

Grey 1998 (13)	6 months	77	Children 57% female Type 1	Specialist	No	No	Yes	No	Yes	Children's Depression Inventory (CDI)
Henry 1997 (14)	Post treatment	21	Elderly 53% female Type 2 Poor control	Specialist	No	No	No	No	Yes	Beck Depression Inventory (BDI)
Huang 2002 (15)	3 months	59	Type 2	Unclear	No	No	No	No	Yes	Zung Depression Scale
Ismail 2008 MET (16)	12 months	238	60% female Type 1 Poor control	Specialist	Yes	Yes	Yes	No	No	Patient Health Questionnaire (PHQ 9)
Ismail 2008 MET+CBT (16)	12 months	227	60% female Type 1 Poor control	Specialist	Yes	Yes	Yes	No	No	Patient Health Questionnaire (PHQ 9)
Jacobi 2002 mastery (17)	18 weeks	26	Elderly 49% female Mix	Specialist	No	No	No	No	No	Personality Assessment Inventory (PAI) - depression scale
Jacobi 2002 support (17)	18 weeks	24	Elderly 49% female Mix	Specialist	No	No	No	No	No	Personality Assessment Inventory (PAI) - depression scale
Janssen 2009 (18)	12 months	498	Elderly 46% female Type 2	Primary Care	No	No	Yes	Yes	Yes	Short Form 36 mental health scale
Karlsen 2004 (19)	6 months	92	48% female Mix	Community	No	No	No	No	No	Psychological well being (combined Zung, Hopkins Symptom Check List and WHO-Ten)

Katon 2006 (20,21)	24 months	329	Elderly 65% female Type 2	Primary care	No	No	Yes	Yes	Yes	Depression free days
Koehler 1981 progressive relaxation (22)	4 weeks	17	71% female Type 1	Community	No	No	No	No	Yes	IPAT anxiety scale
Koehler 1981 self-relaxation (22)	4 weeks	17	71% female Type 1	Community	No	No	No	No	Yes	IPAT anxiety scale
Kulzer 2007 self management group (23)	3 months	127	Elderly 50% female Type 2	Community	Yes	Yes	Yes	Yes	Yes	Psychological Strain Questionnaire
Kulzer 2007 self management individual (23)	3 months	130	Elderly 50% female Type 2	Community	Yes	Yes	Yes	Yes	Yes	Psychological Strain Questionnaire
Lambers 2008 combination (24)	3 months	35	Elderly 37% female Type 2	Specialist Primary care	No	No	Yes	Yes	Yes	Short Form 36 mental health scale
Lambers 2008 exercise (24)	3 months	35	Elderly 37% female Type 2	Specialist Primary care	No	No	Yes	Yes	Yes	Short Form 36 mental health scale
Ligtenberg 1998 (25)	6 weeks	58	Elderly 66% female Type 2	Primary care	No	No	No	No	Yes	Bradley Well Being Questionnaire
Litaker 2003 (26)	12 months	157	Elderly 58% female Type 2	Primary care	No	No	No	No	Yes	Short Form 36 mental health scale

Lustman 1998 (27)	6 months	51	Elderly 60% female Type 2 Poor control	Primary care	Yes	Yes	Yes	Yes	Yes	Beck Depression Inventory (BDI)
Ma 2006 (28)	Post treatment	67	43% female Type 2	Unclear	No	No	No	No	Yes	Self-rating depression scale (SDS)
Maljanian 2005 (29)	3 months	507	Elderly 53% female Type 2	Specialist	No	No	No	No	No	Centre for Epidemiological Studies Depression Scale (CESD)
McGinnis 2005 (30)	4 weeks	39	Elderly 76% female Type 2	Community	No	No	No	No	No	Beck Depression Inventory (BDI)
McGrady 1999 (31)	1 month	18	44% female Type 1	Community	No	No	No	No	Yes	Zung Depression Scale
O'Kane 2008 (32)	12 months	184	Elderly 40% female Type 2	Specialist	Yes	Yes	Yes	Yes	Yes	Well Being Questionnaire (WBQ-22) total wellbeing scale
Piette 2000 (33)	12 months	280	Elderly 59% female Mix	Primary care	Yes	Yes	No	Yes	Yes	Centre for Epidemiological Studies Depression Scale (CESD)
Pouwer 2001 (34)	12 months	400	Elderly 53% female Mix	Specialist	Yes	No	No	Yes	Yes	Short Form 36 mental health scale

Robertson 2002 (35)	60 days	71	Elderly 55% female Type 2 Poor control	Unclear	Yes	No	No	No	Yes	Well Being Questionnaire (WBQ-22) total wellbeing scale
Rosal 2005 (36)	6 months	25	Elderly 80% female Type 2	Community	No	No	No	No	Yes	Centre for Epidemiological Studies Depression Scale (CESD)
Rost 1991 (37)	4 months	61	60% female Mix Poor control	Community Specialist	No	No	No	No	Yes	Functional status questionnaire psychological functioning
Scott 1984 (38)	4 weeks	85	Type 2	Specialist	Yes	No	No	No	No	Speilberger self evaluation questionnaire for depression
Siebolds 2006 (39)	6 months	250	Elderly 48% female Type 2	Primary care Specialist	No	No	No	No	Yes	Well Being Questionnaire (WBQ-22) depression scale
Speiss 1995 (40)	9 months	23	39% female Type 1	Specialist	No	Yes	Yes	No	Yes	Beck Depression Inventory (BDI)
Sykes 2004 (41)	3 months	36	Elderly 69% female Type 2	Specialist	No	No	No	No	Yes	Short Form 36 mental health scale
Toobert 2007 (42)	6 months	279	Elderly 100% female Type 2	Specialist	No	No	No	Yes	Yes	Medical Outcomes Study (MOS 12) mental health

van der Ven	3 months	107	59% female	Specialist	Yes	No	No	Yes	No	Centre for
2005 (43)			Type 1							Epidemiological
			Poor control							Studies Depression
										Scale (CESD)
Wagner 2001	24 months	707	Elderly	Primary care	No	No	No	Yes	Yes	Centre for
(44)			47% female							Epidemiological
			Mix							Studies Depression
										Scale (CESD)
Weinburger	12 months	275	Elderly	Primary care	No	No	No	No	Yes	Short Form 36
1995 (45)			1% female							mental health scale
			Type 2							
			Poor control							

Online Appendix Figure 2 Meta analysis of HbA1c outcomes

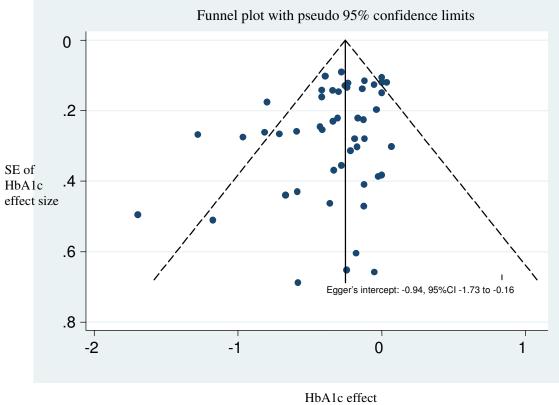
Study ID	ES (95% CI)	% Weight
Aikens 1997	-0.67 (-1.53, 0.19)	0.73
Alam 2004	-1.17 (-2.17, -0.17)	0.56
Bing 2005	-0.42 (-0.70, -0.14)	3.32
Bond 2007	-0.59 (-1.10, -0.08)	1.69
DAFNE 2002	-0.80 (-1.14, -0.45)	2.73
Davies 2008	-0.28 (-0.46, -0.10)	4.40
De Wit 2008	0.07 (-0.52, 0.66)	1.36
Didjurgeit 2002	-0.17 (-0.76, 0.42)	1.35
George 2008	-0.04 (-0.42, 0.35)	2.40
Gilden 1992	-0.12 (-0.93, 0.68)	0.83
Glasgow 2006	-0.12 (-0.35, 0.11)	3.85
Graue 2005	-0.17 (-0.60, 0.27)	2.10
Grey 1998	-0.34 (-0.79, 0.11)	1.99
Henry 1997	-0.36 (-1.27, 0.55)	0.67
Huang 2002	-0.97 (-1.51, -0.43)	1.56
Ismail 2008 MET	-0.14 (-0.41, 0.14)	3.39
Ismail 2008 MET+CBT	-0.34 (-0.62, -0.06)	3.31
loophi 2002 montony	-0.05 (-1.34, 1.24)	0.35
Jacobi 2002 support	-0.58 (-1.93, 0.77)	0.32
Janssen 2009	-0.39 (-0.59, -0.19)	4.15
Karlsen 2004	-0.41 (-0.91, 0.09)	1.74
Katon 2004	0.03 (-0.20, 0.27)	3.76
Koehler 1981 progressive relaxation	-0.18 (-1.36, 1.01)	0.41
Koehler 1981 self-relaxation	-0.24 (-1.52, 1.03)	0.36
Kulzer 2007 self management group	-0.13 (-0.57, 0.31)	2.05
Kulzer 2007 self management individual	-0.31 (-0.74, 0.13)	2.09
Lambers 2008 combination	-0.02 (-0.78, 0.73)	0.91
Lambers 2008 exercise	0.00 (-0.75, 0.75)	0.93
Ligtenberg 1998	-0.12 (-0.67, 0.43)	1.52
Litaker 2003	-0.42 (-0.73, -0.10)	2.97
Lustman 1998	-0.22 (-0.83, 0.40)	1.28
Ma 2006	-1.28 (-1.81, -0.75)	1.62
Maljanian 2005	-0.24 (-0.47, 0.00)	3.73
McGinnis 2005	-0.33 (-1.05, 0.39)	0.99
McGrady 1999	-0.12 (-1.05, 0.80)	0.65
O'Kane 2008	0.00 (-0.29, 0.29)	3.18
Piette 2000	-0.05 (-0.30, 0.20)	3.62
Pouwer 2001	0.00 (-0.21, 0.21)	4.06
Robertson 2002	-0.81 (-1.33, -0.30)	1.67
Rosal 2005	-1.70 (-2.67, -0.73)	0.59
Rost 1991	-0.19 (-0.74, 0.36)	1.52
Scott 1984	-0.71 (-1.23, -0.19)	1.63
Siebolds 2006	-0.24 (-0.51, 0.02)	3.47
Speiss 1995	-0.59 (-1.43, 0.25)	0.76
Sykes 2004	-0.28 (-0.98, 0.42)	1.05
Toobert2007	-0.26 (-0.51, -0.00)	3.57
Wagner 2001	0.00 (-0.24, 0.24)	3.75
Weinburger 1995	-0.30 (-0.59, -0.01)	3.24
van der Ven 2005	-0.43 (-0.91, 0.05)	1.82
Overall (I-squared = 45.0%, p = 0.000)	-0.29 (-0.37, -0.21)	100.00
NOTE: Weights are from random effects analysis		

©2009 American Diabetes Association. Published online at <u>http://care.diabetesjournals.org/cgi/content/full/dc09-1519/DC1</u>

Study ID	ES (95% CI)	% Weight
Aikens 1997	-0.19 (-1.03, 0.65)	0.91
Alam 2004	- 0.15 (-0.78, 1.07)	0.78
Bing 2005	-0.34 (-0.61, -0.06)	3.18
Bing 2003	-0.93 (-1.54, -0.32)	1.46
	-0.53 (-1.54, -0.52)	2.77
Davies 2008	-0.05 (-0.22, 0.13)	3.88
De Wit 2008	0.20 (-0.40, 0.79)	1.52
Didjurgeit 2002	0.27 (-0.33, 0.86)	1.52
George 2008	-0.04 (-0.43, 0.34)	2.47
Gilden 1992	-0.54 (-0.43, 0.54)	0.95
Glasgow 2006	-0.34 (-1.33, 0.28) 0.00 (-0.23, 0.23)	3.53
Graue 2005	-0.19 (-0.63, 0.24)	2.21
Grey 1998		2.13
Henry 1997	-0.07 (-0.52, 0.37) -1.03 (-1.98, -0.07)	0.74
Huang 2002	-1.03 (-1.96, -0.07) -0.62 (-1.14, -0.10)	1.79
Ismail 2008 MET		2.99
Ismail 2008 MET	0.00 (-0.30, 0.31)	2.99
	0.21 (-0.10, 0.53)	
Jacobi 2002 mastery	0.05 (-1.11, 1.22)	0.53 0.51
Jacobi 2002 support	-0.01 (-1.19, 1.17)	
Janssen 2009 Karlsen 2004	0.18 (-0.01, 0.38)	3.73 1.91
	-0.17 (-0.66, 0.33)	
Katon 2004	-0.26 (-0.50, -0.02)	3.46
Koehler 1981 progressive relaxation	0.07 (-1.11, 1.26)	0.51
Koehler 1981 self-relaxation	0.07 (-1.20, 1.35)	0.45
Kulzer 2007 self management group	-0.48 (-0.93, -0.03)	2.14
Kulzer 2007 self management individual	-0.32 (-0.75, 0.11)	2.21
		1.05
Lambers 2008 exercise	-0.27 (-1.02, 0.48)	1.08
Ligtenberg 1998	-0.69 (-1.25, -0.12)	1.62
Litaker 2003	-0.07 (-0.38, 0.24)	2.93
Lustman 1998	-0.66 (-1.30, -0.02)	1.38
Ma 2006	-1.28 (-1.81, -0.76)	1.78
Maljanian 2005	0.17 (-0.07, 0.42)	3.38
McGinnis 2005	-0.36 (-1.09, 0.36)	1.15
McGrady 1999	-0.28 (-1.21, 0.65)	0.78
O'Kane 2008	0.38 (0.09, 0.68)	3.05
Piette 2000	-0.30 (-0.55, -0.04)	3.35
Pouwer 2001	-0.29 (-0.50, -0.08)	3.63
Robertson 2002	-0.15 (-0.64, 0.35)	1.91
Rosal 2005	0.11 (-0.73, 0.95)	0.92
Rost 1991	-0.21 (-0.76, 0.33)	1.68
Scott 1984	-0.14 (-0.65, 0.37)	1.85
Siebolds 2006	-0.26 (-0.52, 0.01)	3.27
Speiss 1995	-1.15 (-2.04, -0.26)	0.83
Sykes 2004	-0.17 (-0.87, 0.52)	1.22
Toobert2007	-0.06 (-0.31, 0.20)	3.35
Wagner 2001	0.01 (-0.23, 0.24)	3.46
Weinburger 1995	0.21 (-0.07, 0.50)	3.11
van der Ven 2005	0.03 (-0.45, 0.51)	2.00
Overall (I-squared = 56.1%, p = 0.000)	-0.16 (-0.25, -0.07)	100.00
NOTE: Weights are from random effects analysis		
-2.04 0	2.04	

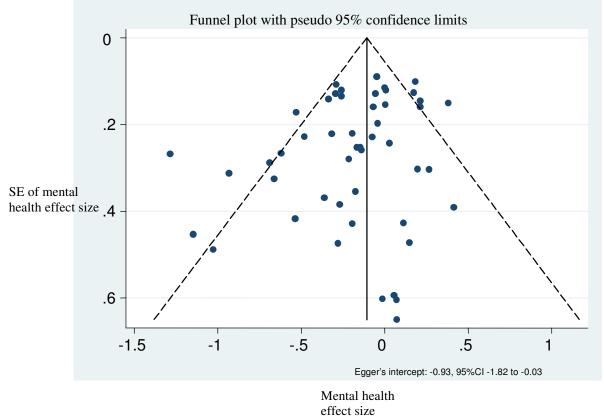
Online Appendix Figure 3 Meta analysis of mental health outcomes

Online Appendix Figure 4 Funnel plot of effect size versus standard error for HbA1c outcomes



size

Online Appendix Figure 5 Funnel plot of effect size versus standard error for mental health outcomes



Reference List

- 1. Aikens J, Kiolbasa T, Sobel R: Psychological predictors of glycemic change with relaxation training in non-insulin-dependent diabetes mellitus. *Psychother Psychosom* 66:302-306, 1997
- 2. Alam S, Stolinski M, Pentecost C, Boroujerdi M, Jones R, Sonksen P, Umpleby A: The effect of a six-month exercise program on very low-density lipoprotein apolipoprotein B secretion in type 2 diabetes. *J Clin Endocrinol Metab* 89:688-694, 2004
- 3. Bing S, Bo B, Hai-ling S: Effects of Diabetes Education and Psychological Intervention on Comprehensive Treatment of Type 2 Diabetes. *Chinese J Clin Psychol* 13:483-485, 2005
- 4. Bond G, Burr R, Wolf F, Price M, McCurry S, Teri L: The effects of a web-based intervention on the physical outcomes associated with diabetes among adults age 60 and older: a randomized trial. *Diabet Technol Therapeutics* 9:52-59, 2007
- 5. DAFNE Study Group: Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: dose adjustment for normal eating (DAFNE) randomised controlled trial. *BMJ* 325:746-751, 2002
- 6. Davies M, Heller S, Skinner T, Campbell M, Carey M, Cradock S, Dallosso H, Daly H, Doherty Y, Eaton S, Fox C, Oliver L, Rantell K, Rayman G, Khunti K, Diabetes Education and Self Management for Ongoing and Newly Diagnosed Collaborative: Effectiveness of the diabetes education and self management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: cluster randomised controlled trial. *BMJ* 336:491-495, 2008
- 7. De Wit M, Delemarre-Van Der Waal H, Bokma J, Haasnoot K, Houdijk M, Gemke R, Snoek F: Monitoring and discussing health-related qulaity of life in adolescents with type 1 diabetes improves psychosocial well being. *Diabet Care* 31:1521-1526, 2008
- 8. Didjurgeit U, Kruse J, Schmitz N, Stückenschneider P, Sawicki P: A time-limited, problem-orientated psychotherapeutic intervention in Type 1 diabetic patients with complications: a randomized controlled trial. *Diabet Med* 19:814-821, 2002
- George J, Valdovinos A, Russell I, Dromgoole P, Lomax S, Torgerson D, Wells T, Thow J: Clinical effectiveness of a brief educational intervention in Type 1 diabetes: results from the BITES (Brief Intervention in Type 1 diabetes, Education for Self-efficacy) trial. *Diabet Med* 25:1447-1453, 2008
- 10. Gilden J, Hendryx M, Clar S, Casia C, Singh S: Diabetes support groups improve health care of older diabetic patients. *J Am Geriatr Soc* 40:147-150, 1992
- 11. Glasgow R, Nutting P, Toobert D, King D, Strycker L, Jex M, O'Neill C, Whitesides H, Merenich J: Effects of a brief computer-assisted diabetes self-management intervention on dietary, biological and quality-of-life outcomes. *Chronic Illness* 2:27-38, 2006
- 12. Graue M, Wentzel-Larsen T, Hanestad BR, Søvik O: Evaluation of a programme of group visits and computer-assisted consultations in the treatment of adolescents with Type 1 diabetes. *Diabet Med* 22:1522-1529, 2005
- 13. Grey M, Boland E, Davidson M, Yu C, Sullivan-Bolyai S, Tamborlane W: Short-term effects of coping skills training as adjunct to intensive therapy in adolescents. *Diabet Care* 21:902-908, 1998

- 14. Henry J, Wilson P, Bruce D, Chisholm D, Rawling P: Cognitive-behavioural stress management for patients with non-insulin dependent diabetes mellitus. *Psychol Health Med* 2:109-118, 1997
- 15. Huang X, Song L, Li T, Li J, Li N, Wu S: Effect of health education and psychosocial intervention on depression in patients with type II diabetes. *Chinese Ment Health J* 16:149-151, 2002
- 16. Ismail K, Thomas S, Maissi E, Chalder T, Schmidt U, Bartlett J, Patel A, Dickens C, Creed F, Treasure J: Motivational enhancement therapy with and without cognitive behaviour therapy to treat type 1 diabetes. *Ann Intern Med* 149:708-719, 2008
- 17. Jacobi, S. Effects of psychological differentiation on success with self management of diabetes. 2002. Unpublished PhD thesis, Columbia University.
- Janssen P, Gorter K, Stolk R, Rutten G: Randomised controlled trial of intensive multifactorial treatment for cardiovascular risk in patients with screen-detected type 2 diabetes: 1-year data from the ADDITION Netherlands study. *Br J Gen Pract* 59:43-48, 2009
- 19. Karlsen B, Idsoe T, Dirdal I, Rokne HB, Bru E: Effects of a group-based counselling programme on diabetes-related stress, coping, psychological well-being and metabolic control in adults with type 1 or type 2 diabetes. *Pat Educ Couns* 53:299-308, 2004
- 20. Simon G, Katon W, Lin E, Rutter C, Manning W, Von Korff M, Ciechanowski P, Ludman E, Young B: Cost effectiveness of systematic depression treatment among people with diabetes mellitus. *Arch Gen Psychiatry* 64:65-72, 2007
- 21. Katon W, Von Korff M, Lin E, Simon G, Ludman E, Russo J, Walker E, Bush T: The Pathways study: a randomized trial of collaborative care in patients with diabetes and depression. *Arch Gen Psychiatry* 61:1042-1049, 2004
- 22. Koehler, B. The effects of relaxation on psychological and physical measure in diabetes mellitus. 1981. New York, Unpublished PhD thesis, St John's University.
- 23. Kulzer B, Hermanns N, Reinecker H, Haak T: Effects of self-management training in Type 2 diabetes: A randomized, prospective trial. *Diabet Med* 24:415-423, 2007
- 24. Lambers S, Van Laethem C, Van Acker K, Calders P: Influence of combined exercise training on indices of obesity, diabetes and cardiovascular risk in type 2 diabetes patients. *Clin Rehab* 22:483-492, 2008
- 25. Ligtenberg P, Godaert G, Hillenaar E, Hoekstra J: Influence of a physical training program on psychological well-being in elderly type 2 diabetes patients. Psychological well-being, physical training, and type 2 diabetes. *Diabet Care* 21:2196-2197, 1998
- 26. Litaker D, Mion L, Planavsky L, Kippes C, Mehta N, Frolkis J: Physician nurse practitioner teams in chronic disease management: the impact on costs, clinical effectiveness, and patients' perception of care. *J Interproff Care* 17:223-237, 2003
- 27. Lustman P, Griffith L, Freedland K, Kissel S, Clouse R: Cognitive behavior therapy for depression in type 2 diabetes mellitus. A randomized, controlled trial. *Ann Intern Med* 129:613-621, 1998
- 28. Ma Z, Li M, Chuan-sheng W: Effects of comprehensive psycho-intervention on life quality and carbohydrate metabolism in patients with type 2 diabetes mellitus. *Chinese J Clin Rehab* 10:15-17, 2006
- 29. Maljanian R, Grey N, Staff I, Conroy L: Intensive telephone follow-up to a hospitalbased disease management model for patients with diabetes mellitus. *Dis Manag* 8:15-25, 2005

- 30. McGinnis R, McGrady A, Cox S, Grower-Dowling K: Biofeedback-assisted relaxation in type 2 diabetes. *Diabet Care* 28:2145-2149, 2005
- 31. McGrady A, Horner J: Role of mood in outcome of biofeedback assisted relaxation therapy in insulin dependent diabetes mellitus. *Appl Physiol Biofeedback* 24:79-88, 1999
- 32. O'Kane M, Bunting B, Copeland M, Coates V, ESMON study group: Efficacy of self monitoring of blood glucose in patients with newly diagnosed type 2 diabetes (ESMON study): randomised controlled trial. *BMJ* 336:1177, 2008
- 33. Piette J, Weinberger M, McPhee S: The effect of automated calls with telephone nurse follow-up on patient-centered outcomes of diabetes care: a randomized, controlled trial. *Med Care* 38:218-230, 2000
- 34. Pouwer F, Snoek F, van der Ploeg H, Adèr H, Heine R: Monitoring of psychological well-being in outpatients with diabetes: effects on mood, HbA(1c), and the patient's evaluation of the quality of diabetes care: a randomized controlled trial. *Diabet Care* 24:1929-1935, 2001
- 35. Robertson, J. Evaluation of an andragogical intervention on the self-care behaviors of adults with non-insulin dependent diabetes mellitus. 2004. Unpublished PhD thesis, University of Arkansas.
- 36. Rosal M, Olendzki B, Reed G, Gumieniak O, Scavron J, Ockene I: Diabetes selfmanagement among low-income Spanish-speaking patients: a pilot study. *Ann Behav Med* 29:225-235, 2005
- 37. Rost K, Flavin K, Cole K, McGill J: Change in metabolic control and functional status after hospitalization. Impact of patient activation intervention in diabetic patients. *Diabet Care* 14:881-889, 1991
- 38. Scott R, Beaven D, Stafford J: The effectiveness of diabetes education for non-insulindependent diabetic persons. *Diabetes Educ* 10:36-39, 1984
- 39. Siebolds M, Gaedeke O, Schwedes U, SMBG Study Group: Self-monitoring of blood glucose--psychological aspects relevant to changes in HbA1c in type 2 diabetic patients treated with diet or diet plus oral antidiabetic medication. *Pat Educ Couns* 62:104-110, 2006
- 40. Spiess K, Sachs G, Pietschmann P, Prager R: A program to reduce onset distress in unselected type I diabetic patients: effects on psychological variables and metabolic control. *Eur J Endocrinol* 132:580-586, 1995
- 41. Sykes K, Yeung T, Ko G: A 12-week prospective randomized controlled trial to investigate the effects of aerobic training on type 2 diabetes patients. *Am J Recreation Ther* 3:36-42, 2004
- 42. Toobert D, Glasgow R, Strycker L, Barrera JM, Ritzwoller D, Weidner G: Long-term effects of the Mediterranean lifestyle program: A randomized clinical trial for postmenopausal women with type 2 diabetes. *Int J Beh Nutr Phys Activity* 4: 2007
- 43. van der Ven N, Hogenelst M, Tromp-Wever A, Twisk J, van der Ploeg H, Heine R, Snoek F: Short-term effects of cognitive behavioural group training (CBGT) in adult Type 1 diabetes patients in prolonged poor glycaemic control. A randomized controlled trial. *Diabet Med* 22:1619-1623, 2005
- 44. Wagner E, Grothaus L, Sandhu N, Galvin M, McGregor M, Artz K, Coleman E: Chronic care clinics for diabetes in primary care: a system-wide randomized trial. *Diabet Care* 24:695-700, 2001

45. Weinberger M, Kirkman M, Samsa G, Shortliffe E, Landsman P, Cowper P, Simel D, Feussner J: A nurse-coordinated intervention for primary care patients with non-insulindependent diabetes mellitus: impact on glycemic control and health-related quality of life. *J Gen Intern Med* 10:59-66, 1995