Table 1: Studies included in the meta-analysis

First author and year of publication	Country	Study disign	Felow up	population	Age range	Sex	Sample size	Diabetes	Exposure	outcome	Anxiety types in study	Quality assessment: Risk of bias *					Results	Pooled ratio	Adjustment for other covariates
												Selection	Performance	Detection bias	Confounding	Attrition			
Almawi 2008	Bahrain	cross-sectional	-	Adult, with and Without Diabetes	31-60	Both %63.6 women	275	Diagnosed based on WHO diagnostic And classification criteria	type 2 diabetes	DASS-21score (Current Anxiety)	-	Mode rate	Low	Mode rate	Low	Low	Odds ratio in mild anxiety 3.78 (CI 2.07-6.99), 8.14 (CI 4.11-16.12)in severe anxiety	5.37 (CI 3.41-8.47)	age, Education, number of children perhousehold,duration of T2DM, gender, chronic disease other thanT2DM, family income, employment, smoking
Bener 2011	Qatar	case-control	-	Adults, with and Without Diabetes Mellitus	25-65	Both% 47.2 women	1778	Self-reported or taking oral medications or insulin for diabetes were considered as Having DM. WHO Expert Committee group (fasting venous blood glucose concentration ≥7.0mmol/l and/or 2h post-OGTT venous blood glucose concentration ≥11.1 mmol/l.	type 2 diabetes	Hospital Anxiety and Depression Scale (HADS) (Current Anxiety)	-	Mode rate	Mode rate	Mode rate	Mode rate	Low	Odds ratio in mild anxiety 2.97 (CI 2.35-3.75), in Severe anxiety 4.57 (CI 3.53-5.91)	3.60 (CI 3.03-4.28)	matched case-control for age, gender and ethnicity
Bouwman 2010	Netherla nds	Cross-sectional	-	Adults , with and Without type 2 diabetes	40–65	Both% 52.7 women	2667	Clinical assessment, WHO diagnostic And classification criteria Type 2 diabetes was defined as FPG≥7.0 mmol/l or 2hrPG ≥11.1 mmol/l.	type 2 diabetes	Hospital Anxiety and Depression Scale – Anxiety Subscale (HADS-A, score≥8) (Current Anxiety)	-	Mode rate	Low	Mode rate	Mode rate	low	Odds ratio in men 1.58 (CI 0.82-3.06), in women 1.36 (0.74–2.51)	1.45 (CI 0.93-2.28)	age, education and family history of diabetes, triglycerides, HDL cholesterol, and total cholesterol, hypertension, smoking and waist circumference
Deschênes 2015	Canada	cross-sectional	-	Adults , with and Without diabetes	30-70	women	17623	self-reported	Unknown	World Mental Health—Composite Internation al Diagnostic Interview 3.0 (WMH-CIDI)	Generali zed anxiety disorder	Low	Mode rate	Mode rate	Low	Moderat e	Odds ratio generalized anxiety disorder 1.57 (CI 0.92-2.66)	1.57 (CI 0.92-2.66)	age, gender, race, education, marital status, smoking status, alcohol consumption frequency, and BMI

Study	Country	Design		Population	Age	Sex	N	Diabetes assessment	Diabetes type	Anxiety assessment	Anxiety type						Result	OR (CI)	Adjustments
										according to the Diagnostic and Statistical Manual of Mental Disorders, (12- month prevalence)									
Van Dooren 2016	Netherlands	cross-sectional	-	Adults , with and without type 2 diabetes	40-75	Both 45.2 % women	862	by an oral glucose tolerance test, is defined according to the WHO 2006 criteria, for type 2 diabetes fasting plasma glucose of≥7.0 mmol/L or a 2-h plasma glucose of≥11.1 mmol/L	type 2 diabetes	Mini-International Neuropsychiatric Interview (MINI) according to the DSM-IV, 7-item Generalized Anxiety Disorder scale (GAD-7), (Current anxiety)	Generalized anxiety disorder	Mode rate	Low	Mode rate	Mode rate	Low	Odds ratio in GAD-7 score 1.03 (CI 0.99-1.08), GAD-7≥10 1.50 (CI 0.72-3.12)	1.03 (CI 0.98-1.07)	age, sex and education level
El-Gabalawy 2011	Canada	cross-sectional	-	Adults, with and without diabetes	55-older	Both 53.2 % women	12,792	Self-report	Unknown	World Mental-Health Composite International Diagnostic Interview (CIDI) based on Diagnostic and Statistical Manual of Mental Disorders, clinician-administered structured clinical interview diagnoses (12-month prevalence)	Panic disorder. Agoraphobia, social phobia, PTSD	Mode rate	Mode rate	Mode rate	Low	Moderate	Odds ratio 1.23 (CI 0.90-1.67)	1.23 (CI 0.90-1.67)	sex, age, education, marital status, income, mood disorder and any substance use disorder
Gale 2011	UK	Prospective cohort	First study 54 years, second	older people,	≥60	Both 41 % women	5570	Self-report	unknown	Hospital Anxiety Scale	-	Low	Mode rate	Mode rate	Mode rate	Moderate	ABC men: 1.77 (0.49–6.32)	1.32 (CI 1.03-1.68)	Childhood social class, current

			study 20 years, third study 64 years, fourth study 73 years, fifth study 69 years	with and without diabetes						(Current Anxiety)							ABC women: 4.95 (0.94–26.21) CaPS men: 1.15 (0.69–1.91) HAS men: 0.94 (0.36–2.46) HAS women: 1.20 (0.38–3.81), HCS men 1.54 (0.98-2.41), HCS women 1.13 (0.69-1.84), LBC men: 0.99 (0.21–4.66) LBC women: 1.80 (0.63–5.20)		social class, BMI, flamingo stand time, Grip strength, disability
Goodwin 2005	USA	cross-sectional	-	Adults, with and without diabetes	15–54	Both 58.2% in diabetes, 52.4% in no diabetes	5877	Self-report	unknown	World Health Organization (WHO) Composite International Diagnostic Interview, (12- month prevalence)	Specific phobia, Social phobia, Agoraphobia, Panic attacks, Panic disorder, Posttraumatic stress disorder	Mode rate	Mode rate	Mode rate	Low	Moderate	Odds ratio Specific phobia 1.43 (CI 0.72-2.86), Social phobia 1.68 (CI 0.79-3.58), Agoraphobia 2.17 (CI 0.89-9.53), Panic attacks 1.47 (CI 0.67-3.25), Panic disorder 1.46 (CI 0.47-4.06), Posttraumatic stress disorder2.30 (CI 1.02-5.21),	1.68 (CI 1.19-2.36)	age, sex, race, marital status, education, and income

Kruse 2003	Germany	cross-sectional	-	Adults, with and without diabetes	18–79	Both 43% women in diabetes, 49.9% in control	4181	self-reported	type 1 & 2 diabetes	Composite International Diagnostic Screener (CID-S) for mental disorders, panic disorder, agoraphobia, social phobia, simple phobia, generalized anxiety disorder, obsessive-compulsive disorders (1-month prevalence)	Agoraphobia, GAD, OCD, panic disorders, simple phobia, social phobia	Moderate	Low	Moderate	Moderate	Moderate	Odds ratio 2.05 (CI 1.22-2.43)	2.05 (CI 1.22-2.43)	age, sex, socioeconomic status, and family status
Lin 2008	17 countries	cross-sectional	-	Adults, with and without diabetes	Age range ≥18, except for Colombia, Mexico (18–65), Japan (≥20), and Israel (≥21)	Both 52% women	42,697	self-reported	unknown	WHO Composite International Diagnostic Interview, Disorders were assessed using the definitions and criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV, SCID), (1-month prevalence)	Agoraphobia or panic disorder GAD, PTSD, social phobia	Moderate	Low	Moderate	Low	Moderate	Odds ratio in Generalized anxiety 1.60 (CI 1.30-2.00), in Agoraphobia or panic disorder 1.50 (CI 1.10-1.90), in Social phobia 1.30 (CI 1.10-1.60), in PTSD 1.30 (CI 1.10-1.80)	1.41 (CI 1.26-1.57)	age–gender
Lukaschek 2013	Germany	cross-sectional	-	Adults, with and without diabetes	32–81	Both 40.5% women with T2D, 53.0% women with Prediabe	2970	Clinical assessment, was defined as a validated physician diagnosis or current use of glucose-	type 2 diabetes	assessed in a personal interview using the Generalised Anxiety Disorder-7 (GAD-7),	PTSD	Moderate	Low	Moderate	Low	Moderate	Odds ratio in PTSD 3.56 (CI 1.43-8.52)	3.56 (CI 1.43-8.52)	Age, sex, family status, educational level, obesity, smoking, depression, depressed mood/exhaustion, anxiety, somatic complaints

Study	Country	Study design	Follow-up	Population	Age	Sex	Sample size	Diabetes ascertainment	Diabetes type	Anxiety measure	Anxiety types						Results		Confounders
						tes, 45.5% women with non-diabetic conditions		lowering agent		(current Anxiety)									
Petrak 2003	Germany	Case-control	-	Adults, with and without diabetes	17–40	Both 37.7% women with T1D, 49.2% women without diabetes	2359	diagnosed by general practitioners and confirmed in hospital	type 1 diabetes	structured interview using interviews designed to provide diagnoses according to DSM-IV, (1-month prevalence)	Agoraphobia with/without panic, GAD, OCD, panic with/without agoraphobia, simple Phobia, social phobia.	Moderate	Low	Moderate	Low	Moderate	Odds ratio in PTSD 0.8 (CI 0.5-1.70), Agoraphobia with/without panic 1.70 (CI 0.5-5.00), Simple phobia 0.60 (CI 0. 2-1.40),	0.85 (CI 0.53-1.36)	gender, age, body-mass-index, marital status, years of formal education
Strine 2008	USA	cross-sectional	-	Adults with and without diabetes	18-55	Both 52% women	217,379	Self-report	unknown	single question of lifetime anxiety (lifetime anxiety)	Acute stress disorder, anxiety, GAD, OCD, panic attacks, panic disorder, phobia, PTSD, social anxiety disorder.	Moderate	Moderate	Moderate	Low	Moderate	Odds ratio in Lifetime diagnosis of anxiety 1.2 (CI 1.1-1.4),	1.2 (CI 1.1-1.4)	age, sex, race and ethnicity, education, marital status, employment status, cardiovascular disease status, diabetesstatus, asthma status, smoking status, physical inactivity, obesity, and heavy drinking status
Hasan 2015	Australia	Prospective-cohort	27 years	Adults, with and without diabetes	unknown	women	2791	self-reported	Type 1 & 2 diabetes	Composite International Diagnostic Interview (CIDI) according to the DSM-IV, (lifetime anxiety)	GAD, panic disorder, specific phobias (e.g., social phobia), and posttraumatic stress disorder (PTSD)	Moderate	Moderate	Moderate	Moderate	Moderate	Odds ratio in Lifetime GAD 1.19 (CI 0.76-1.85), Lifetime Panic disorder 1.15 (CI 0.86-1.53), Lifetime Specific phobias 1.31 (CI 0.91-1.89),	1.26 (CI 1.06-1.50)	age, education, income, marital status, body mass index, alcohol consumption, and smoking

																	Lifetime PTSD 1.42 (CI 1.01-2.02)		
Wu 2015	USA	cross-sectional	-	Adults, with and without diabetes	18–90	Both 57.5% women	170,853	Clinical assessment	T2DM	ICD-9-CM diagnosis code corresponding to a DSM-IV-TR diagnosis code, (Current anxiety)	panic, generalized anxiety, phobia, obsessive-compulsive, posttraumatic stress	Low	Low	Mode rate	Mode rate	Moderat e	Odds ratio in anxiety disorder 1.12 (CI 1.06-1.19),	1.12 (CI 1.06-1.19)	age, sex, race and ethnicity
Holt 2009	UK	cross-sectional	-	Adults, with and without diabetes	59–73	Both 47.5% women	2997	Clinical assessment	unknown	Hospital Anxiety and Depression Scale (HADS) (Current Anxiety)	-	Mode rate	Low	Mode rate	Mode rate	Moderat e	Odds ratio anxiety In men 1.15 (CI 0.71-1.84), 1.36 (CI 0.89-2.10) in women	1.26 (CI 0.91-1.73)	Age, BMI, smoking, social class and alcohol consumption
Bodenlos 2009	USA	cross-sectional	-	Adults, with and without diabetes	≥18	Both 56% women	4476	Self-reported	unknown	Composite International Diagnostic Interview (CIDI) according to the DSM-IV (12-month prevalence)	-	Low	Mode rate	Mode rate	Low	Moderat e	Social phobia: 2.03 (1.0–4.14) GAD: 0.85 (0.33–2.19) Panic disorder: 1.33 (0.72–2.46) Agoraphobia: 2.03 (1.60–3.89)	1.67 (CI 1.23-2.27)	Age, gender, race, income, education and smoking status
Das-Munshi 2007	UK	cross-sectional	-	adults, with and without diabetes	16–74	Both 50% women	8580	Self-report	unknown	Clinical interview Schedule (1- month prevalence)	GAD, OCD, panic disorder, phobias	Mode rate	Mode rate	Mode rate	Low	Moderat e	Odds ratio anxiety 1.20 (CI 0.70-2.00)	1.20 (CI 0.70-2.00)	Age, gender, ethnicity, socioeconomic status, impairment on activities of daily living and physical co-morbidity
de Winter 2015	Netherla nds	cross-sectional	-	older people, with and without diabetes	50>	Both 48.7% women	990	Clinical assessment	Type 1 & 2 diabetes	screening instrument s of Anxiety, Depression , And Mood Scale	-	Mode rate	Low	Mode rate	Mode rate	Moderat e	Odds ratio 2.4(CI 1.2-4. 9)	2.4(CI 1.2-4. 9)	unadjusted

Study	Country	Study design	Duration	Population	Age	Sex	Sample size	Assessment	Diabetes type	Anxiety measure	Anxiety disorders						Odds ratio	Effect	Adjustment
										(ADAMS), Glasgow Anxiety Scale, Anxiety sub-scale of the Hospital Anxiety and Depression Scale (HADS-A) (Current anxiety)									
Tu 2017	Taiwan	retrospective cohort	10years	Adults, with and without diabetes	20-80	Both 51.5% women	778123	Clinical assessment	type 2 diabetes	International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), (Current anxiety)	-	Low	Low	Low	High	Low	Odds ratio 1.81(CI 1.76-1.85)	1.81(CI 1.76-1.85)	unadjusted
Shahi 2017	Iran	Case-control	-	Adults, with and without diabetes	Mean=57.84 SD=10.46 in diabetes, mean=54.87 SD=9/46 in control	Both 50% women	120	Clinical assessment	type 2 diabetes	Depression, anxiety and stress scale (DASS), (Current anxiety)	-	Mode rate	Low	Mode rate	High	Moderate	Odds ratio 0.26(CI 0.13-0.52)*	0.26(CI 0.13-0.52)*	unadjusted
Yoong 2017	Singapore	RCT	-	Adults, with and without diabetes	age≥21	Both 59% women	526	Clinical assessment	Type 1 or Type 2	Hospital Anxiety and Depression Scale (HADS), (Current anxiety)	-	Low	Low	Mode rate	Low	Moderate	Odds ratio 1.33(CI 0.91-1.93)	1.33(CI 0.91-1.93)	matched case-control for age, on hemodialysis for a minimum of 3 months, language, cognitive, major visual or auditory impairments and life-limiting condition diagnosis
Meurs 2016	Netherlands	Prospective-cohort	7 years	Adults, with and without diabetes	Mean=45.5 SD=0.75	Both 59% women	90,686	Clinical assessment & Self-reported	Unknown	Mini-International Neuropsychiatric Interview, (Current anxiety)	panic disorder, agoraphobia, social anxiety disorder, and GAD	Low	Low	Mode rate	Low	Moderate	Odds ratio 1.42 (CI 1.22-1.65)	1.42 (CI 1.22-1.65)	age, sex, r comorbidity and depressive disorder

*Odd ratio calculated by authors