

Supplementary file 3: ROBINS-I assessments for studies providing sufficient data to calculate the difference in change between quitters and continuing smokers from baseline to longest follow-up: Anxiety

Study	Bias due to confounding	Bias in selection of participants into the study (pre-filled)	Bias in classification of interventions (Bias in classification of quitting smoking)	Bias due to deviations from the intended intervention (Bias due to deviations from quitting/continuing smoking (i.e., relapsing) or access to psychoactive treatments)	Bias due to missing data	Bias in measurement of outcomes (pre-filled)	Bias in selection of the reported result	Overall risk of bias
Becerra 2002	Serious	Low	Low	Low	Low	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined as: Self-reported point-prevalence abstinence – immediately after program (not smoking in previous 24 hours) and at the 3-, 6- and 12-month follow-ups (not smoking previous 7 days; self-reported continuous abstinence – at the 3-, 6- and 12-month follow-ups (i.e. not smoking since initial quitting).	Justification: Participants were excluded if they were receiving psychotherapy/ psychoactive drugs external to the study. No psychoactive interventions were delivered as part of the study.	Justification: 214 participants were recruited, 200 were analysed.	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimates was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: One domain judged as being at serious risk of bias.
Bock 2012	Serious	Low	Low	Moderate	Low	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after	Justification: Smoking cessation was clearly defined as: 7-day point prevalence abstinence (7PPA), verified by saliva cotinine level less than 57 nmol/L (15 ng/mL) at the end of treatment (week 8)	Justification: There were deviations from intended intervention, but their impact on the outcome is expected to be slight. Participants were randomly allocated to cognitive behavioural therapy for smoking cessation and were randomized to a twice-weekly program of Vinyasa yoga or a general health	Justification: 55 participants at baseline, and 52 at follow-up.	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental	Justification: No evidence that the effect estimates was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in	Justification: One domain judged as being at serious risk of bias.

	time-varying confounding.	the start of quitting smoking.	and all follow-up assessments.	and wellness program (control). In this study the authors report that yoga improved negative affect, and also that yoga led to smoking cessation at 8-weeks follow-up, but the effect on smoking cessation did not last to later follow-up points. Therefore it is unlikely that yoga had an impact on the association between mental health and smoking, in this study. Therefore the psychoactive treatments in this study were balanced between quitters/continuing smokers. The outcome data that we have extracted, have not been estimated relative to relapsing.		health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	question, or different subgroups.	
Covey 2015	Serious	Low	Low	Moderate	Low	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined as: point-prevalence weekly abstinence, at week 1 and week 6 after target quit date, biovalidated by exhaled carbon monoxide < 8 ppm.	Justification: Participants were excluded if they had a "psychiatric diagnosis other than ADHD or nicotine dependence, and the use of combination treatments". There was no appropriate analysis to address the issue of relapsing. No psychoactive interventions were delivered as part of the study.	Justification: 255 were recruited and all were analysed in the analysis.	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: One domain judged as being at serious risk of bias.
Dawkins 2009	Serious	Low	Low	Low	Low	Low	Low	Serious

	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined as: Continuous abstinence (maintained cotinine- or CO-verified abstinence at all follow-ups).	Justification: Exclusion criteria included current diagnosis of psychiatric or neurological condition, regular use of prescription or class A recreational drugs – therefore participants were unlikely to require psychoactive interventions during the study period. No psychoactive interventions were delivered as part of the study.	Justification: Participants were not excluded due to missing outcome data on smoking status or mental health. Some data were missing for some variables, usually due to calibration or technical problems (this was one or two data points).	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: One domain judged as being at serious risk of bias.
Dulger 2019	Serious	Low	Low	Moderate	Low	Serious	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined. At end of 6th month smokers separated into subgroups of 'quit smoking' versus 'not quit smoking'.	Justification: As smoking cessation treatment, bupropion hydrochloride was given to 23 patients (42.6%). Participants with psychiatric disease were excluded.	Justification: Outcome data were available for over 70% of participants.	Justification: Evidence of multiple testing of quitting/mental health association.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: Two domains judged as being at serious risk of bias.
Farris 2015	Serious	Low	Low	Low	Serious	Low	Serious	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after	Justification: Smoking cessation was clearly defined as: 'successful quitters' based on consistent biochemical verification at week 1, week 2 and month 1 post-intervention (i.e. quit-day). Bio-verified	Justification: Patients received "anxiety-focused" smoking cessation treatment, and this was added as a covariate in the model. Exclusionary criteria included current use of smoking cessation products or treatment, regular use of other tobacco products, unstable psychotropic	Justification: Outcome data were available for 85% of participants. However, imbalance in accurate classification with missing data in verification of quit status, it was determined that individuals would be included in the analyses if they had	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants	Justification: IDAS measures anxiety and depression (sub-scales) but only report on anxious arousal in this paper. IDAS data were collected at month 1 and 3, but results not reported.	Justification: Three domains judged as being at serious risk of bias.

	time-varying confounding.	the start of quitting smoking.	by expired CO ≤4 ppm, as abstinent.	medication (had to be stable ≥3 months), history of panic disorder (defined by the DSM-IV-TR), past-month suicidality, a history of psychotic-spectrum disorders". Therefore the population will be pretty stable at baseline and unlikely to access psychoactive treatments.	data available for at least two time points, and for whom a consistent pattern (i.e., non-quitter or successful quitter) was present.	would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.		
Guimond 2017	Serious	Low	Low	No information	Low	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined as: a participant who reported an occasional or a daily usage at one time point and a non-usage at the following time point.	Justification: There was not enough information to judge this domain.	Justification: Outcome data were available for 74% of participants (110/149).	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: One domain judged as being at serious risk of bias.
Hammett 2019	Serious	Low	Low	No information	Moderate	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after	Justification: Smoking cessation was clearly defined. A self-report measure was used to assess 6-month prolonged smoking abstinence at 12-month follow-up.	Justification: Not enough information was provided to answer all signalling questions in this domain. No psychoactive treatments were offered as part of the study.	Justification: Not enough information was provided to answer all signalling questions in this domain. 939 and 1382 available at baseline. 585 and 882 available at follow-up for outcome data. Data only available for 63% of baseline sample. There are a lot of	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of	Justification: One domain judged as being at serious risk of bias.

	time-varying confounding.	the start of quitting smoking.			missing data, so people were probably excluded for missing smoking status data, and other variables that were included in the adjusted models.	would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	the association in question, or different subgroups.	
Lubitz 2019	Serious	Low	Low	No information	No information	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined. The primary smoking cessation outcome was 7-day point-prevalence abstinence.	Justification: Adherence to psychoactive treatments was not assessed external to the study to see if it was balanced between quitters and smokers/ adjusted for in the analysis.	Justification: Not enough information was provided to answer all signalling questions in this domain. There were probably missing outcome data, although this was not adequately described "Participants who completed the pre-quit session (Week 0) and were randomized to a treatment arm but were lost to follow-up or failed to provide the CO measure were considered not abstinent."	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: One domain judged as being at serious risk of bias.
Martinez-Gonzalez 2018	Serious	Low	Low	No information	Moderate	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after	Justification: Smoking cessation was clearly defined. Smoking status was evaluated from the clinical history and it was confirmed by co-oximetry.	Justification: Adherence to psychoactive treatments as part of the study balanced between quitters and smokers. Adherence to psychoactive treatments was not assessed external to the study to see if it was balanced between quitters and smokers/ adjusted for in the analysis.	Justification: Outcome data were available for 85% of participants (278/328). Participants were likely to have been excluded due to missing smoking status data.	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of	Justification: One domain judged as being at serious risk of bias.

	time-varying confounding.	the start of quitting smoking.				would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	the association in question, or different subgroups.	
McDermott 2013	Serious	Low	Low	No information	Low	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: : Quitting smoking was clearly defined. Prolonged abstinence from smoking at 6 months, was defined as sustained abstinence after an initial 2-week grace period, was assessed using self-reported behaviour with biochemical validation as recommended for clinical trials.	Justification: No psychoactive treatment was provided as part of the intervention. Information was not provided regarding all psychoactive treatments. The paper reports that approx. 80% with psych disorders took psychoactive medicines, but this information is not provided by smoking status.	Justification: Outcome data were available for 77.6% of participants (491/633).	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: One domain judged as being at serious risk of bias.
Moadel 2012	Serious	Low	Low	No information.	Low	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after	Justification: Smoking cessation was clearly defined. Smoking cessation was ECO-verified 7-day point prevalence abstinence at day 132.	Justification: Not enough information was provided to answer all signalling questions in this domain. Psychoactive treatments were not provided as part of the study.	Justification: Outcome data were available for 124/145 (85.5%) for depression outcome; 138/145 (95.2%) for anxiety outcome. Missing=smoking for smoking status imputation. The analysis was unadjusted, so participants were not	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of	Justification: One domain judged as being at serious risk of bias.

	time-varying confounding.	the start of quitting smoking.			excluded due to missing data on other variables required for the analysis.	would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	the association in question, or different subgroups.	
Rocha 2017	Serious	Low	Low	No information	Serious	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined. Participants self-reported whether they smoked even a puff in the past 7 days.	Justification: Not enough information was provided to answer all signalling questions in this domain. Psychoactive treatments were not provided as part of the study.	Justification: 45/110 were lost to follow-up (41%). Table 2 suggests that those lost to follow-up were not assumed to be smoking. Participants who did not attend follow-up for any reason were not included in the analysis. There was evidence that those reasons for missing data differed across smoking status "The 45 participants who were not included at Time 3 presented significantly higher nicotine dependence at Time 1 ($M = 4.98$, $SD = 2.22$) than the 65 participants included ($M = 3.80$, $SD = 1.88$) ($t(108) = 3.00$, $p = .003$, 95% IC [0.40, 1.96], $\eta^2 = .08$ ", and no analysis adjusting for this was conducted.	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: Two domains judged as being at serious risk of bias.
Schnoll 2016	Serious	Low	Low	No information	Moderate	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics	Justification: Smoking cessation was clearly defined. Point prevalence abstinence at 6 months- self-reported abstinence from smoking for 7 days prior to the	Justification: Not enough information was provided to answer all signalling questions in this domain.	Justification: 69/180 participants were lost to follow-up (38%) with missing outcome data. Missing=smoking for smoking status imputation. All baseline participants were included in the analysis.	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements,	Justification: One domain judged as being at serious risk of bias.

	important time-varying confounding.	observed after the start of quitting smoking.	assessment and biochemically confirmed with breath carbon monoxide.			believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	multiple analyses of the association in question, or different subgroups. Protocol suggests IDS and BAI were the only planned depression and anxiety measures.	
Solomon 2006	Serious	Low	Low	Not information	Moderate	Low	Low	Serious
	Justification: Authors did not use an appropriate analysis method that controlled for all the important time-varying confounding.	Justification: Selection of participants into the study (or into the analysis) was not based on participant characteristics observed after the start of quitting smoking.	Justification: Smoking cessation was clearly defined. Self-reported 7-day point-prevalence abstinence.	Justification: Not enough information was provided to answer all signalling questions in this domain. Participants received counselling as part of the intervention, but no information on adherence by smoking status.	Justification: Outcome data were available for 63% of participants (149/234). To be included in the current study, participants had to have completed assessments of smoking status and psychological symptoms near the time of their first, second, and end-of-pregnancy prenatal visits as part of the routine assessments in the studies from which they were drawn. The analysis for the association between smoking cessation and mental health was not adjusted, and therefore participants were not excluded for missing data for other variables.	Justification: Participants would need to remember what they scored at baseline, and participants will be blinded to the hypothesis of our review/meta-analysis. There is no reason to believe that participants would assess their mental health differently due to quitting status. The same questionnaires would have been administered at the same time and in the same manner for all participants. It is unlikely that measurement error in mental health outcomes would be split by exposure group.	Justification: No evidence that the effect estimate was likely to be selected on the basis of results from multiple outcome measurements, multiple analyses of the association in question, or different subgroups.	Justification: One domain judged as being at serious risk of bias.