

Table S1. Systematic literature review search terms and strategy

Database	Search strategy
Web of Science	TS= (“air pollutants” OR “particulate matter” OR “air pollution” OR “fine particulate” OR “sulfur dioxide” OR “nitrogen dioxide” OR “ozone” OR “nitric oxide” “carbon monoxide” OR “PM2.5” OR “PM10” OR “SO2” OR “NO2” OR “O3” OR “NOX” OR “CO”) AND TS= (“sleep disorders” OR “sleep disturbance”)
ScienceDirect	(“air pollutants” OR “air pollution”) AND (“sleep disorders” OR “sleep disturbance”)
PubMed	((“air pollutants”[All Fields]) OR (“particulate matter”[All Fields]) OR (“fine particulate”[All Fields]) OR (“sulfur dioxide”[All Fields]) OR (“nitrogen dioxide”[All Fields]) OR (“ozone”[All Fields]) OR (“carbon monoxide”[All Fields]) OR “PM2.5”[All Fields] OR “PM10”[All Fields] OR “SO2”[All Fields] OR “NO2”[All Fields] OR “NOX”[All Fields] OR “O3”[All Fields] OR “CO”[All Fields]) AND (“sleep disorders”[Mesh Terms] OR “sleep disorders”[All Fields]) OR (“poor sleep quality”[Mesh Terms] OR “poor sleep quality”[All Fields]) OR (“sleep-breathing disorders”[Mesh Terms] OR “sleep-breathing disorders”[All Fields]) OR (“insomnia”[Mesh Terms] OR “insomnia”[All Fields]))) AND (“2000/01/01”[Date - Publication] : “2023/02/01”[Date - Publication]))
Embase	(‘air pollutants’/exp OR ‘air pollutants’ OR ‘particulate matter’/exp OR ‘particulate matter’ OR ‘fine particulate’ OR ‘sulfur dioxide’/exp OR ‘sulfur dioxide’ OR ‘nitrogen dioxide’/exp OR ‘nitrogen dioxide’ OR ‘ozone’/exp OR ozone OR ‘carbon monoxide’/exp OR ‘carbon monoxide’ OR ‘PM2.5’ OR ‘PM10’ OR ‘SO2’ OR ‘NO2’ OR ‘O3’ OR ‘CO’) AND (‘sleep disorders’/exp OR sleep disorders OR ‘poor sleep quality’/exp OR ‘poor sleep quality’ OR ‘sleep-breathing disorders’/exp OR ‘sleep-breathing disorders’ OR ‘insomnia’/exp OR ‘insomnia’)

Table S2. Quality assessment of included cohort studies

First author (year)	Newcastle-Ottawa Scale								Total
	Selection			Comparability			Outcome		
	1 ^a	2 ^b	3 ^c	4 ^d	5 ^e	6 ^f	7 ^g	8 ^h	
Chen (2019)	1	1	1	0	2	1	1	0	7
Liu (2023)	1	0	1	0	2	1	1	0	6
Nakhjirgan (2019)	0	1	1	0	0	0	0	0	2
Wang(a) (2020)	1	1	1	0	2	1	1	0	7
Wang(b) (2020)	1	1	1	0	2	1	1	0	7
Xu (2021)	1	0	1	0	2	1	0	0	5
Yu (2021)	1	1	1	0	2	1	1	0	7

^a Representativeness of the exposed cohort; ^b Selection of the non-exposed cohort; ^c Ascertainment of exposure.

^d Demonstration that outcome of interest was not present at start of study.

^e Comparability of cohorts on the basis of the design or analysis (adjusted for age and any other factors).

^f Assessment of outcome.

^g Was follow-up long enough for outcomes to occur?

^h Adequacy of follow-up of cohorts

Table S3. Quality assessment of included case-control studies

First author (year)	Newcastle-Ottawa Scale								
	Selection			Comparability			Exposure		Total
	1 ^a	2 ^b	3 ^c	4 ^d	5 ^e	6 ^f	7 ^g	8 ^h	
Tsai (2022)	1	0	1	0	2	1	1	0	6

^a Is the case definition adequate;

^b Representativeness of the cases;

^c Selection of Controls.

^d Definition of Controls.

^e Comparability of cases and controls on the basis of the design or analysis.

^f Ascertainment of exposure.

^g Same method of ascertainment for cases and controls

^h Non-Response rate

Table S4. Assessment of quality of included cross-sectional study by the Joanna Briggs Institute checklist.

First author (year)	1 ^a	2 ^b	3 ^c	4 ^d	5 ^e	6 ^f	7 ^g	8 ^h	Total
Lawrence (2018)	0	1	1	1	1	0	1	1	6
Li (2020)	1	1	1	1	1	0	0	1	6

^a Were the criteria for inclusion were in the sample clearly defined;

^b Were the study subjects and the setting were described in detail;

^c Was the exposure was measured in a valid and reliable way;

^d Were objective, standard criteria used for measurement of the condition;

^e Were confounding factors were identified;

^f Were strategies to deal with confounding factors were stated;

^g Were the outcomes were measured in a valid and reliable way;

^h Was appropriate statistical analysis was used;

Table S5. Publication bias of the included studies.

Pollutant	No. of estimates	Begg's <i>P</i> value	Egger's <i>P</i> value
PM _{2.5}	10	0.152	0.287
PM ₁₀	8	0.266	0.518
NO ₂	7	0.230	0.274

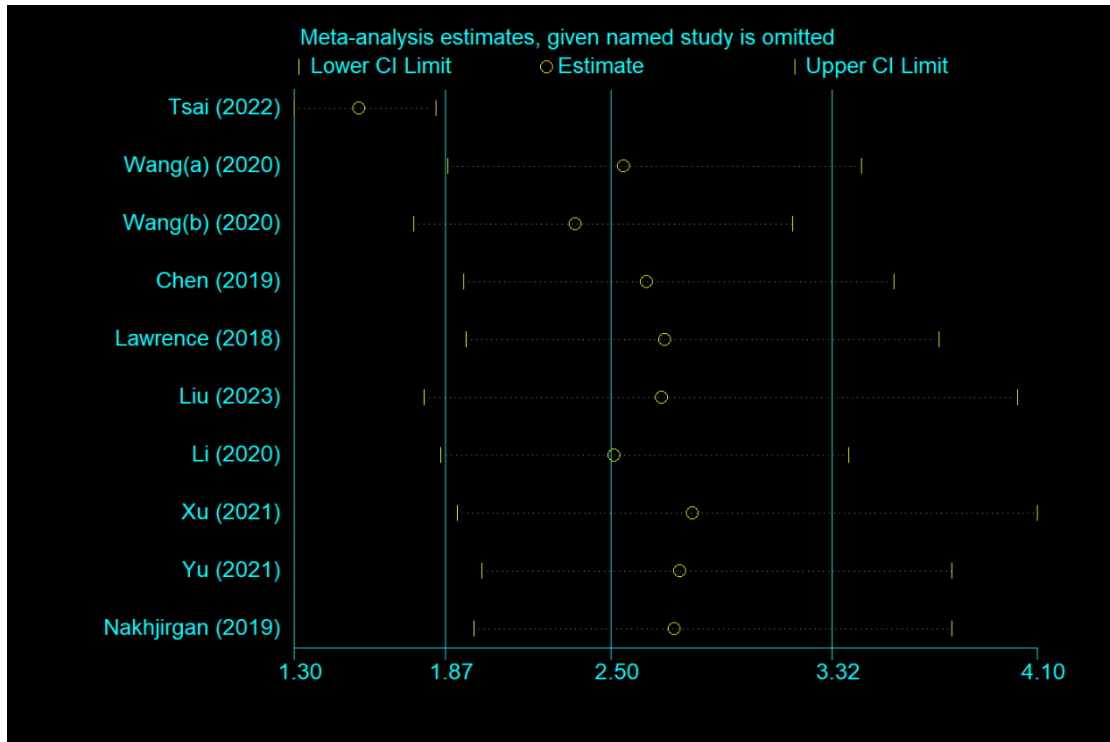


Figure S1 Sensitivity analysis plots of PM_{2.5}

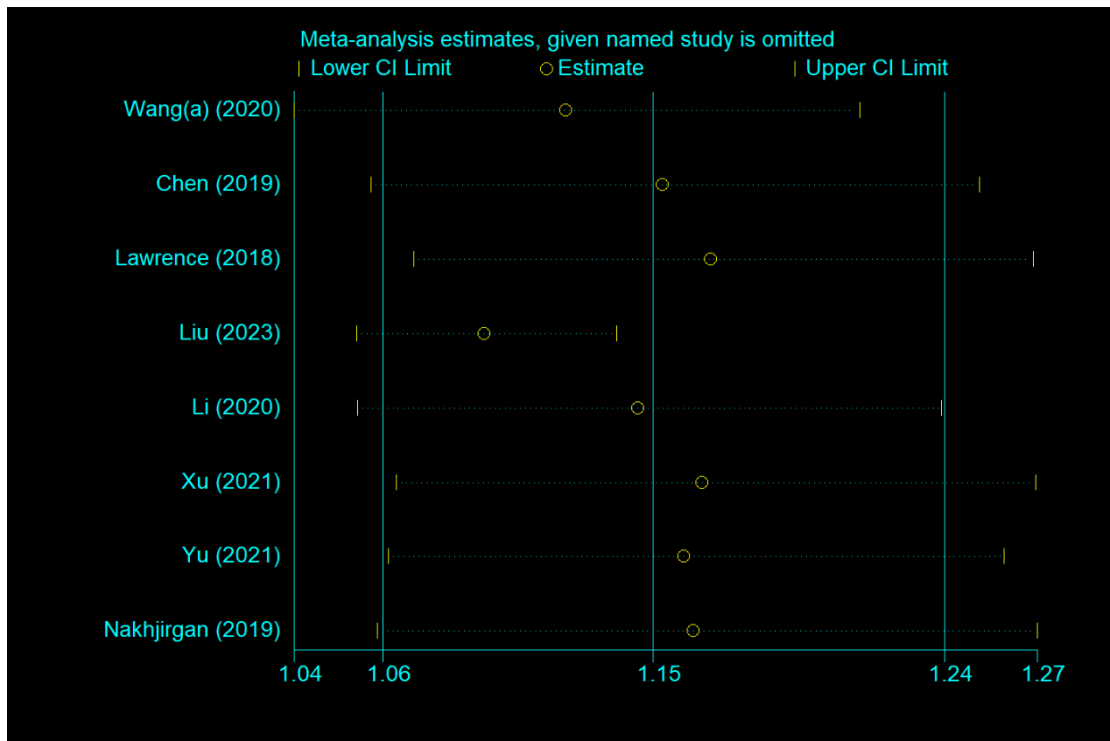


Figure S2 Sensitivity analysis plots of PM₁₀

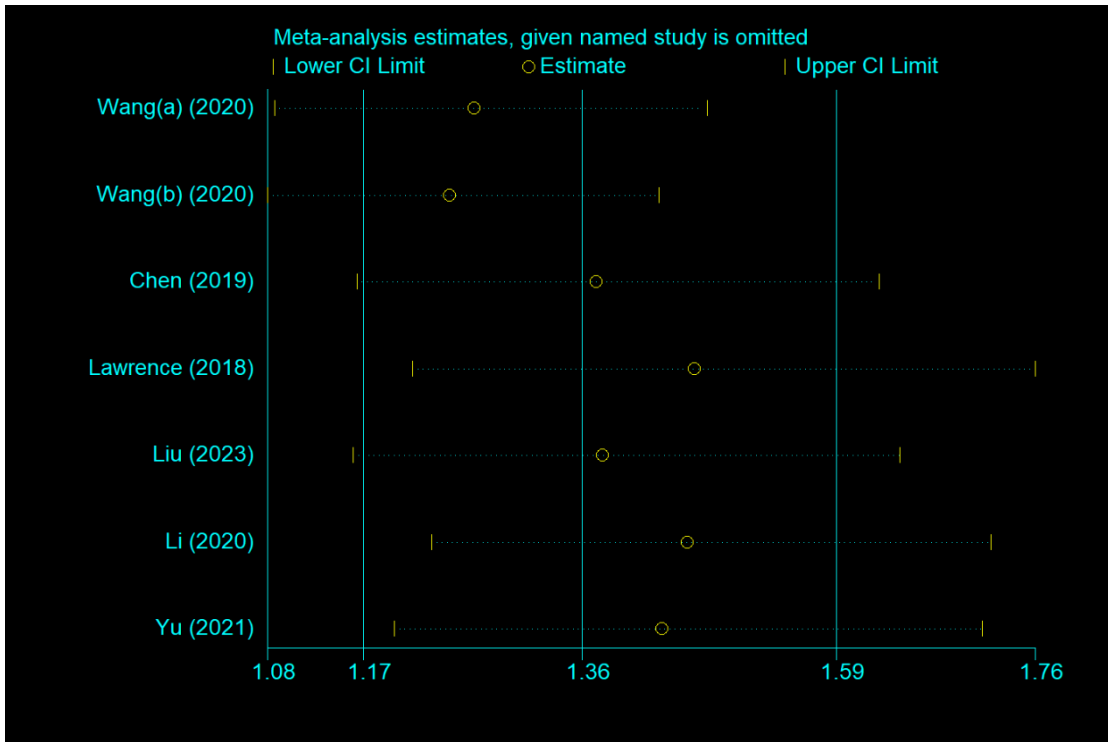


Figure S3 Sensitivity analysis plots of NO₂

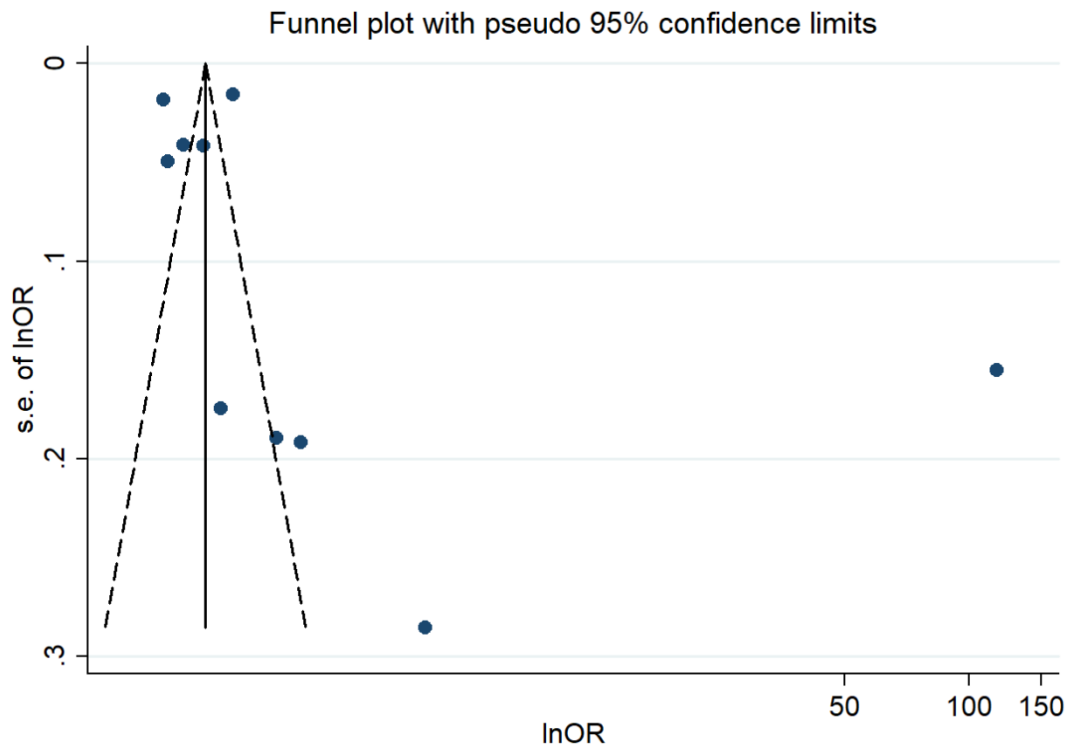


Figure S4 Funnel plot of PM_{2.5}

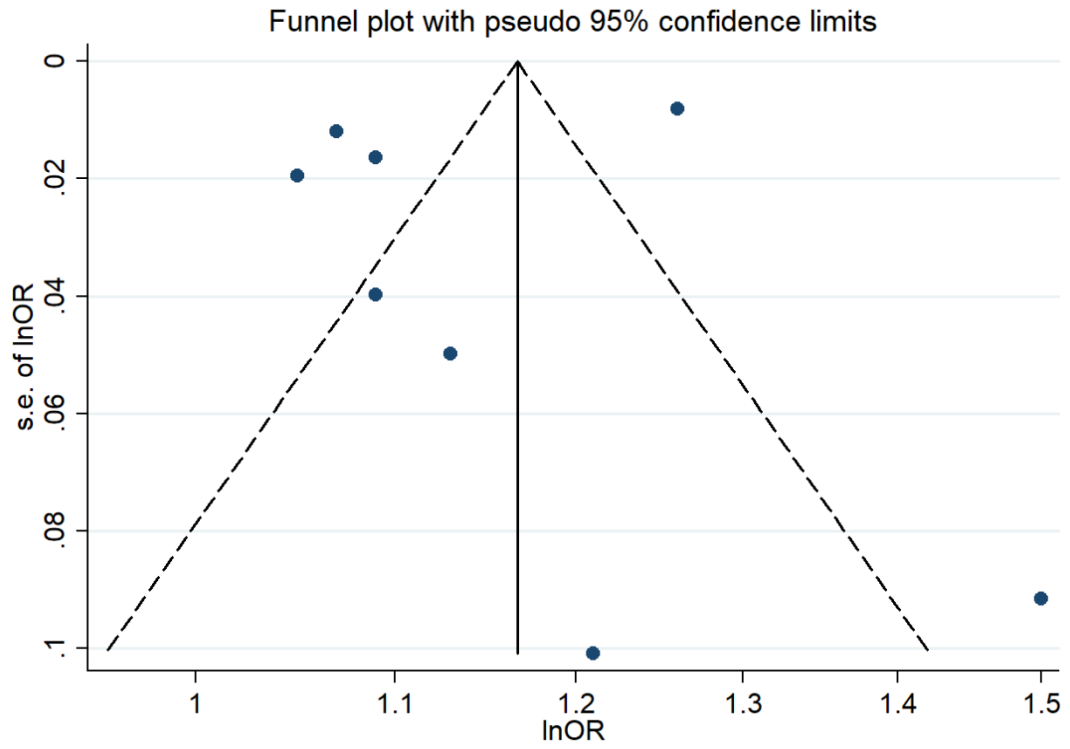


Figure S5 Funnel plot of PM₁₀

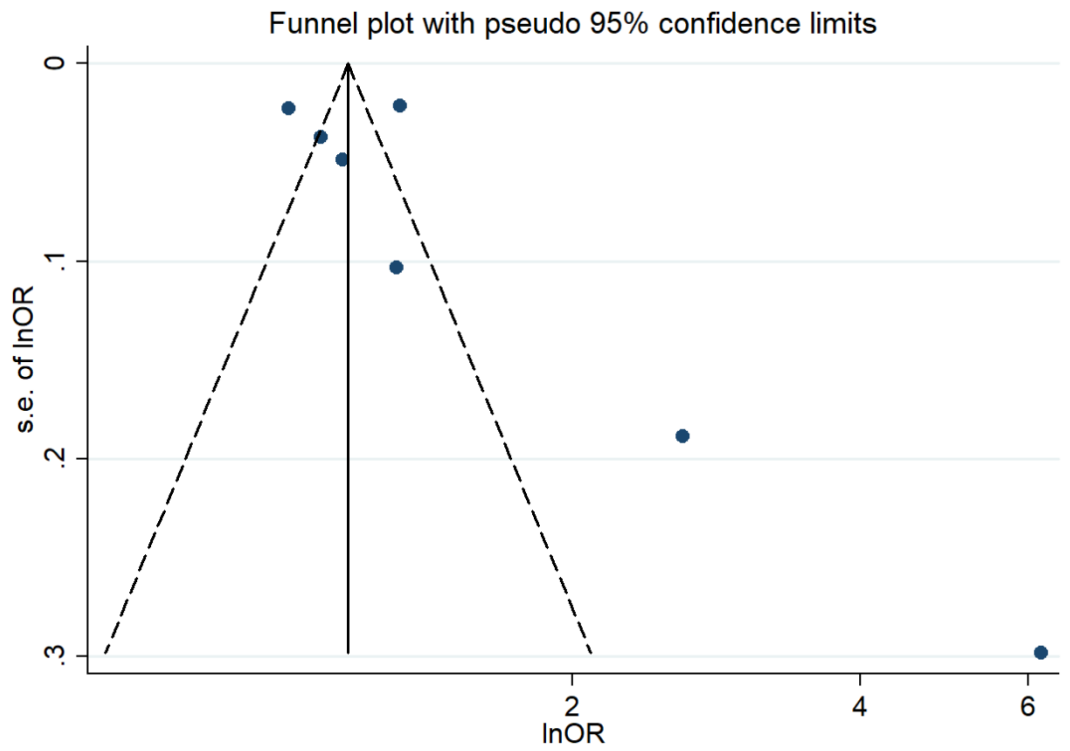


Figure S6 Funnel plot of NO₂

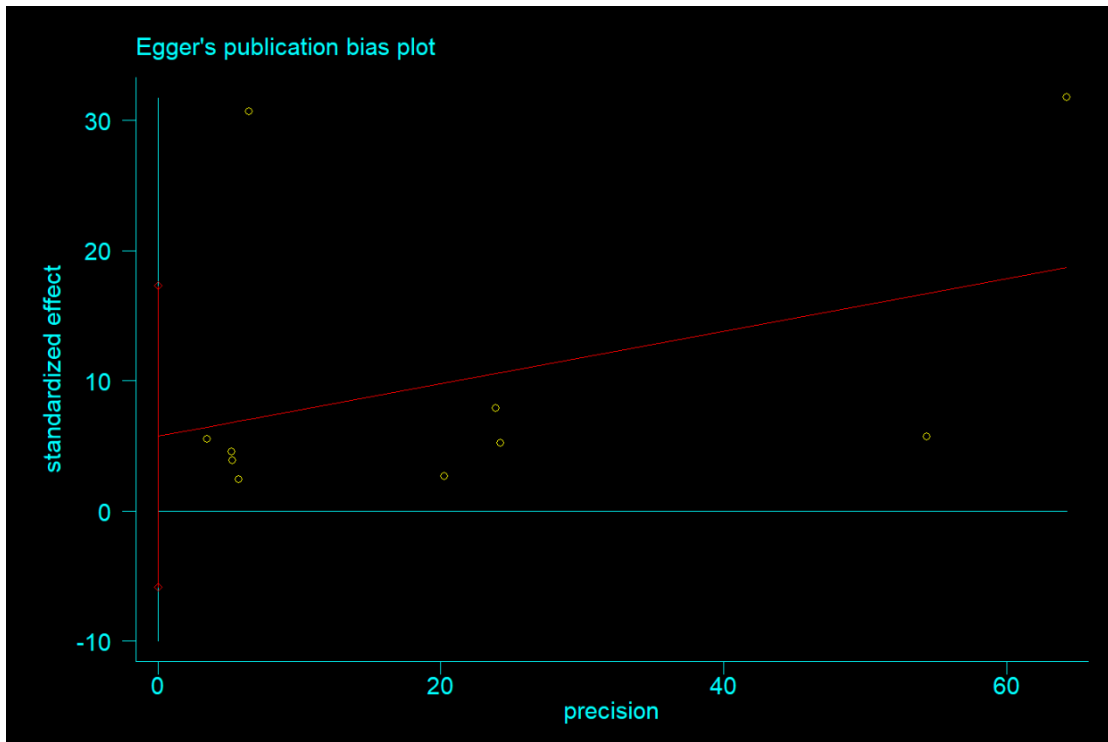


Figure S7 Egger's publication bias plot of PM_{2.5}

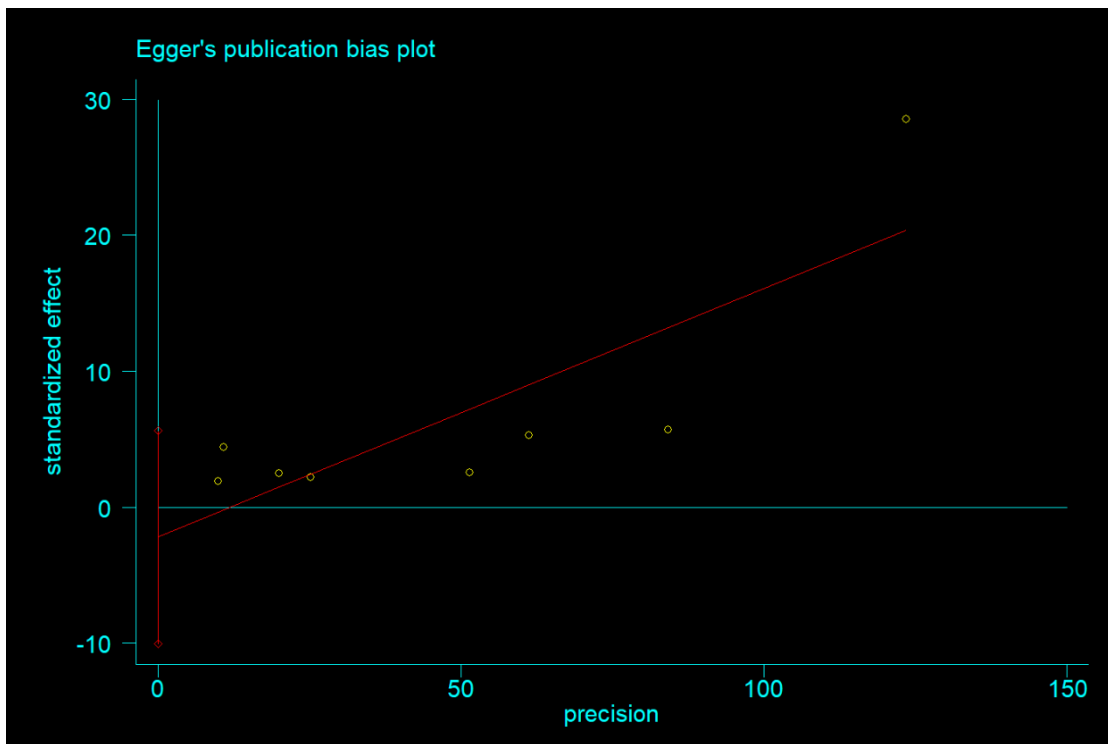


Figure S8 Egger's publication bias plot of PM₁₀

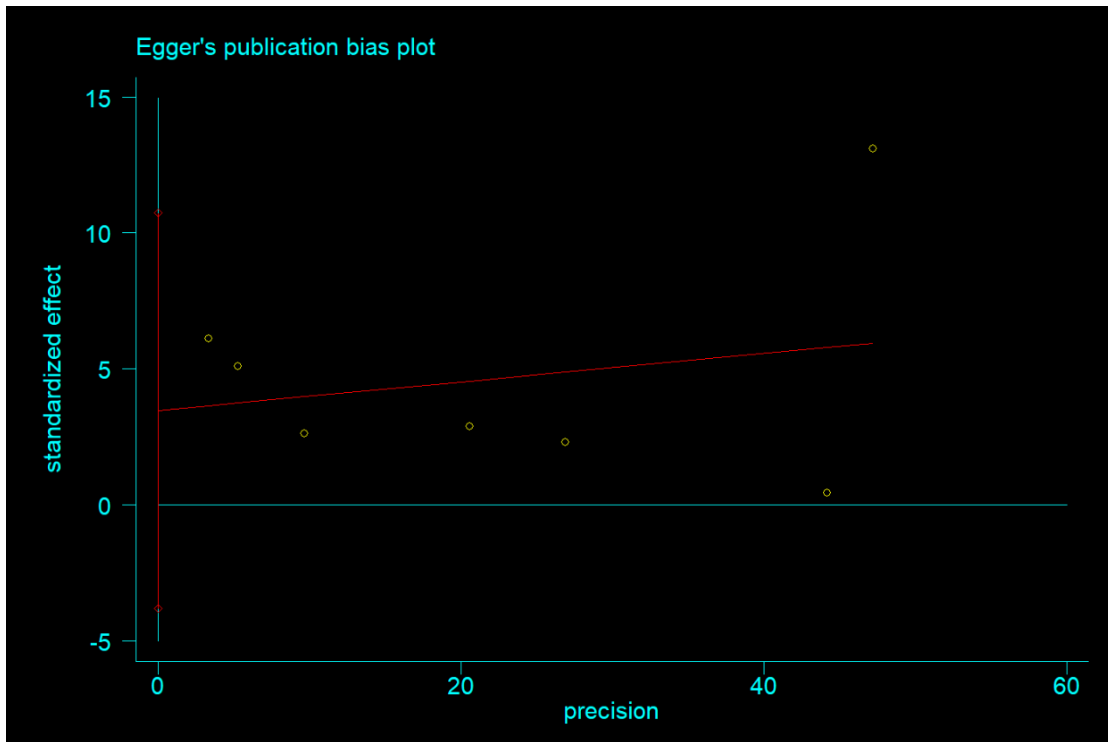


Figure S9 Egger's publication bias plot of NO₂