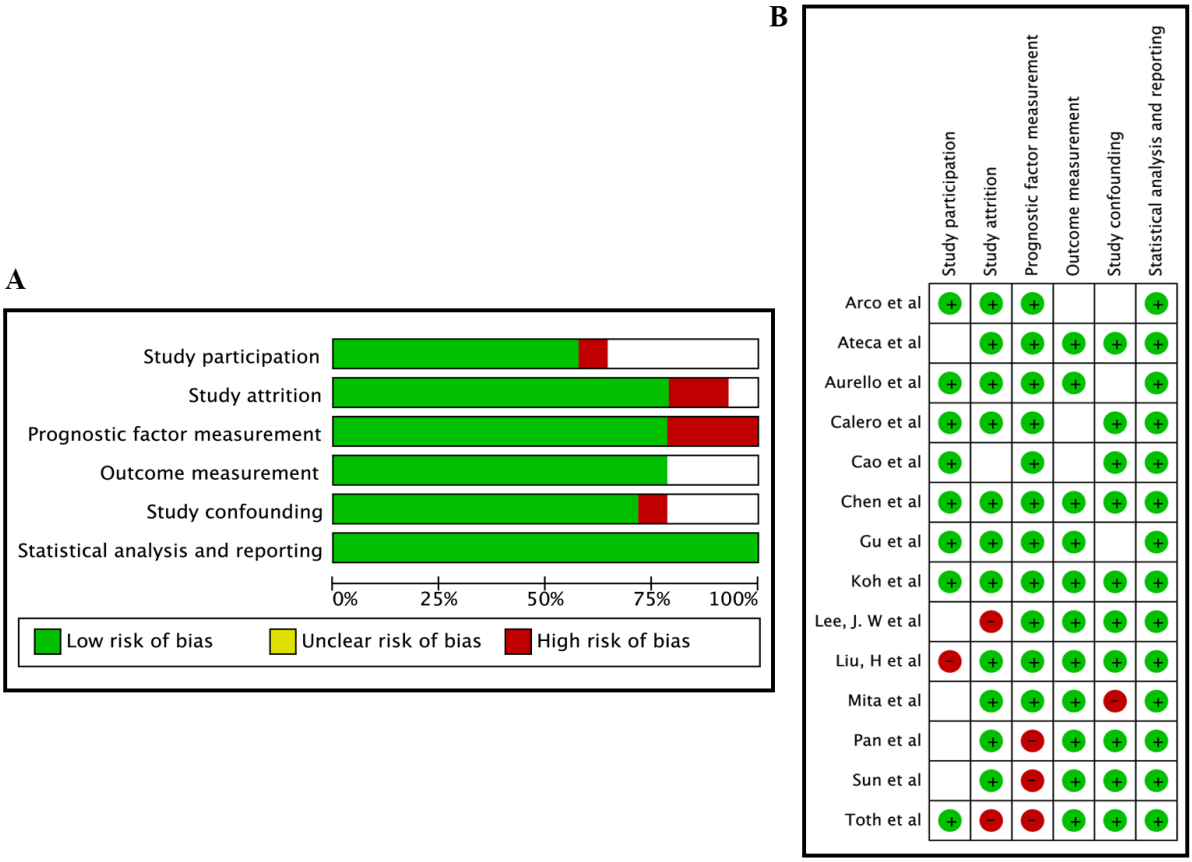
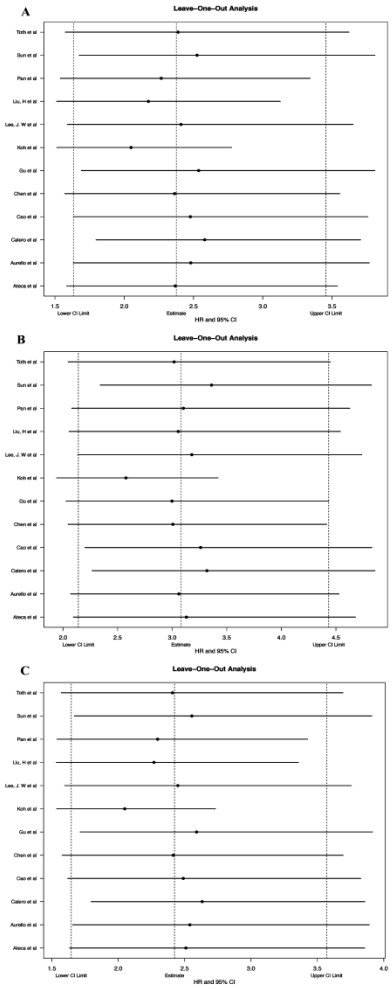
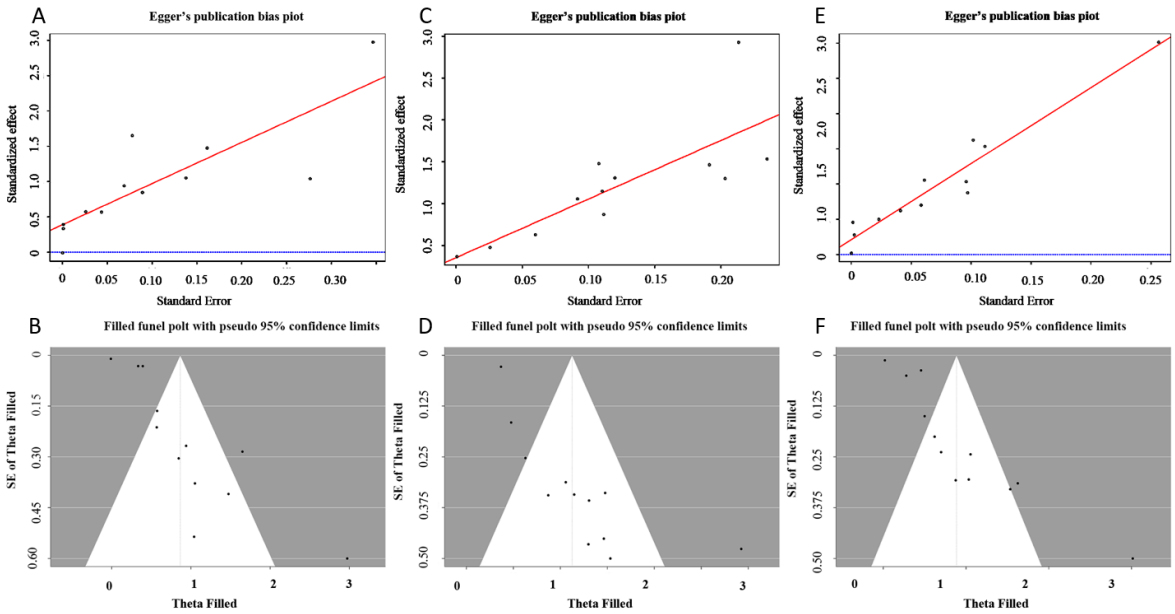


Supplementary Figure 1 Bias risk judgments. A: Graph exhibiting bias risk judgments on bias risk items through reviewers displayed percentage among all included studies. B: Risk of bias sum-marization: Risk of bias item judgment by reviewers for all the included studies.



Supplementary Figure 2 Leave-one-out analysis. A: Sensitivity analysis of the association between positive lymph node ratio (LNR) and overall survival (OS) in gastric cancer patients. B: Sensitivity analysis of the association between Log odds of positive lymph nodes (LODDS) and OS in gastric cancer patients. C: Sensitivity analysis of the association between pathological lymph nodes (pN) and OS in gastric cancer patients.



Supplementary Figure 3 Egger's test results and Trim and Fill results. A: Egger's polt to assess the publication bias effect on the positive lymph node ratio (LNR). B: Egger;s polt to assess the publication bias effect on the log odds of positive lymph nodes (LODDS); C: Egger's polt to assess the publication bias effect on the pathological lymph nodes (pN); D: The polt of trim and fill to evaluate the impact of LNR on overall survival (OS); E: The polt of trim and fill to evaluate the impact of LODDS on OS; F: The polt of trim and fill to evaluate the impact of pN on OS.

Supplementary Table 1 Results of lymph node ratio the subgroup meta-analysis

Subgroup	LNR			
	Analysis method	**HR (95%CI)**	I^2, %	***P* value**
Surgery				
D2	Random	2.63 (1.56-4.42)	87	< 0.001
D1+D2	Random	1.81 (1.37-2.38)	97	< 0.001
Treatment				
NAT	Random	2.30 (1.36-3.90)	72	0.01
Non-NAT	Random	2.03 (1.56-2.66)	97	< 0.001
Population				
Eastern	Random	1.86 (1.37-2.53)	98	< 0.001
Western	Random	1.73 (1.01-2.97)	90	< 0.001
Publication Year				
2010-2016	Random	2.12 (1.71-2.62)	88	< 0.001
2017-2024	Random	2.83 (1.67-4.80)	90	< 0.001
TNM edition				
6th	NA	1.48 (1.39-1.58)	NA	NA
7th	Random	2.87 (1.55-5.34)	94	< 0.001
8th	Random	2.05 (1.34-3.12)	79	0.003
LNs median				
> LNs	Random	3.43 (1.85-6.37)	79	< 0.001
< LNs	Random	1.66 (1.26-2.18)	99	< 0.001

MLNs median				
> MLNs	Random	2.30 (1.39-3.82)	89	< 0.001
< MLNs	Random	2.04 (1.47-2.84)	98	< 0.001

95%CI: 95% Confidence intervals; HR: Hazard ratio; LNs: Number of lymph nodes; LNR: Lymph node ratio; MLNs: Number of metastatic lymph nodes; NA: Not available due to small number of studies included; NAT: Neoadjuvant therapy.

Supplementary Table 2 Results of log odds of positive lymph nodes the subgroup meta-analysis

Subgroup	**LODDS**			
	Analysis method	**HR (95%CI)**	***I*²**, %	***P* value**
Surgery				
D2	Random	2.44 (1.52-3.91)	79	0.007
D1+D2	Random	3.68 (2.12-6.40)	81	< 0.001
Treatment				
NAT	Random	2.22 (1.38-3.58)	76	0.005
Non-NAT	Random	3.74 (2.24-6.24)	80	< 0.001
Population				
Eastern	Random	3.35(1.98-5.67)	89	< 0.001
Western	Random	2.64 (1.59-4.38)	63	0.04
Publication Year				

2010-2016	Random	2.23 (1.56-3.19)	74	0.001
2017-2024	Random	3.99 (2.30-6.92)	76	< 0.001
TNM edition				
6th	NA	1.44 (1.37-1.53)	NA	NA
7th	Random	3.61 (2.08-6.26)	80	< 0.001
8th	Random	3.05 (1.97-4.73)	47	0.13
LNs median				
> LNs	Random	4.55 (2.33-8.86)	72	0.007
< LNs	Random	2.44 (1.58-3.76)	84	< 0.001
MLNs median				
> MLNs	Fixed	4.06 (2.78-5.92)	0	0.97
< MLNs	Random	2.91 (1.76-4.82)	89	< 0.001

95%CI: 95% Confidence intervals; HR: Hazard ratio; LNs: Number of lymph nodes; LODDS: Log odds of positive lymph nodes; MLNs: Number of metastatic lymph nodes; NA: Not available due to small number of studies included; NAT: Neoadjuvant therapy.

Supplementary Table 3 Results of pathological lymph nodes staging the subgroup meta-analysis

Subgroup	**pN**			
	Analysis method	**HR (95%CI)**	***I*²**, %	***P* value**
Surgery				< 0.001

D2	Random	2.76(1.67-4.55)	85	< 0.001
D1+D2	Random	1.88 (1.42-2.50)	94	< 0.001
Treatment				
NAT	Random	2.18 (1.46-3.24)	76	0.006
Non-NAT	Random	2.19 (1.63-2.95)	94	< 0.001
Population				
Eastern	Random	2.54 (1.91-3.38)	90	< 0.001
Western	Random	1.67 (1.05-2.66)	92	< 0.001
Publication Year				
2010-2016	Random	1.88 (1.37-2.58)	97	< 0.001
2017-2024	Random	2.91(1.70-5.00)	91	< 0.001
TNM edition				
6th	NA	1.58 (1.46-1.70)	NA	NA
7th	Random	2.68 (1.57-4.58)	94	< 0.001
8th	Random	2.31 (1.32-4.06)	88	< 0.001
LNs median				
> LNs	Random	3.65 (1.85-7.23)	86	< 0.001
< LNs	Random	1.69 (1.27-2.26)	98	< 0.001
MLNs median				
> MLNs	Random	2.16 (1.35-3.46)	87	< 0.001

< MLNs	Random	2.40 (1.67-3.44)	97	< 0.001

95%CI: 95% Confidence intervals; HR: Hazard ratio; LNs: Number of lymph nodes; MLNs: Number of metastatic lymph nodes; NA: Not available due to small number of studies included; NAT: Neoadjuvant therapy; pN: Pathological lymph nodes.