

Supplementary Material 1 Search Strategy.

Table S1 Search strategy.

PubMed = 56
("Prunus" OR "Prunus cerasus" OR "Montmorency" OR "tart cherry" OR "sour cherry" OR "cherry juice" OR "cherry extract" OR "cherries") AND ("Sleep"[Mesh] OR "Sleep Initiation and Maintenance Disorders"[Mesh] OR "Sleep Wake Disorders"[Mesh] OR sleep* OR insomnia OR "sleep quality" OR "sleep duration" OR "sleep efficiency" OR "sleep onset latency" OR "restless sleep" OR "sleep disturbance")
Scopus = 151
(TITLE-ABS-KEY ("Prunus" OR "Prunus cerasus" OR "Montmorency" OR "tart cherry" OR "sour cherry" OR "cherry juice" OR "cherry extract" OR "cherries")) AND (TITLE-ABS-KEY ("sleep" OR "insomnia" OR "sleep quality" OR "sleep duration" OR "sleep efficiency" OR "sleep onset latency" OR "restless sleep" OR "sleep disturbance"))
Web of Science = 273
ALL = (("Prunus" OR "Prunus cerasus" OR Montmorency OR "tart cherry" OR "sour cherry" OR "cherry juice" OR "cherry extract" OR cherries OR cherry) AND (sleep OR "sleep quality" OR "sleep duration" OR "sleep efficiency" OR "sleep onset latency" OR "sleep disturbance" OR insomnia OR "restless sleep" OR "sleep disorder*" OR "sleep wake disorder*"))

Note. Numbers indicate the records retrieved from each database before deduplication. MeSH, Medical Subject Headings; TITLE-ABS-KEY, title, abstract and keywords; ALL, all searchable fields in Web of Science.

Supplementary Material 2 Sensitivity Analyses.

1. Overall Sleep Quality: All Eligible Comparisons

Leave-one-out sensitivity analysis showed that omitting any single comparison did not materially change the direction or statistical significance of the pooled effect. Estimates remained small and non-significant, and every 95% CI crossed zero. Omitting Sinclair *et al.* [1] gave Hedges' $g = 0.0805$ (95% CI -0.1727 to 0.3336; $P = 0.5332$), whereas omitting Sinclair *et al.* [2] gave Hedges' $g = 0.0578$ (95% CI -0.1669 to 0.2824; $P = 0.6143$). The corresponding estimates were Hedges' $g = 0.0878$ after omission of Tucker *et al.* [3], Hedges' $g = 0.1080$ after omission of Hillman *et al.* [4] (juice), Hedges' $g = 0.1423$ after omission of Hillman *et al.* [4] (capsules), Hedges' $g = 0.1526$ after omission of Kimble *et al.* [5], and Hedges' $g = 0.0868$ after omission of Morehen *et al.* [6]. Full confidence intervals and P -values are reported in Table S2.

Table S2 Leave-one-out sensitivity analysis for overall sleep quality across all eligible comparisons.

Study comparison omitted	Pooled Hedges' g	95% CI lower	95% CI upper	P	τ^2	I^2 (%)
Sinclair <i>et al.</i> [1]	0.0805	-0.1727	0.3336	0.5332	0.0358	67.3526
Sinclair <i>et al.</i> [2]	0.0578	-0.1669	0.2824	0.6143	0.0034	67.2831
Tucker <i>et al.</i> [3]	0.0878	-0.1484	0.3239	0.4663	0.0000	67.1319
Hillman <i>et al.</i> [4] (juice)	0.1080	-0.1128	0.3289	0.3376	0.0000	65.1493
Hillman <i>et al.</i> [4] (capsules)	0.1423	-0.0779	0.3625	0.2052	0.0000	58.3960
Kimble <i>et al.</i> [5]	0.1526	-0.0757	0.3809	0.1903	0.0000	61.8825
Morehen <i>et al.</i> [6]	0.0868	-0.1628	0.3365	0.4954	0.0321	67.3299
Losso <i>et al.</i> [7]	0.0215	-0.1946	0.2375	0.8456	0.0000	63.0162
Howatson <i>et al.</i> [8]	-0.0502	-0.3098	0.2094	0.7047	0.0396	34.5605
Chung <i>et al.</i> [9]	0.0846	-0.2362	0.4054	0.6052	0.1321	66.8401
Pigeon <i>et al.</i> [10]	0.0723	-0.2436	0.3883	0.6537	0.1265	66.1311

Note. Each row presents the pooled Paule-Mandel random-effects estimate after omission of the named comparison. Positive Hedges' g values indicate improved sleep with tart cherry supplementation. CI, confidence interval; I^2 , percentage of variability attributable to between-study heterogeneity; P , two-sided probability value; τ^2 , estimated between-study variance.

The smallest pooled effect occurred after omission of Losso *et al.* [7]: Hedges' $g = 0.0215$ (95% CI -0.1946 to 0.2375; $P = 0.8456$). Omission of Howatson *et al.* [8] produced the only negative pooled estimate, Hedges' $g = -0.0502$ (95% CI -0.3098 to 0.2094; $P = 0.7047$), although this result was also non-significant. Heterogeneity generally remained moderate to substantial. It decreased to $I^2 = 34.56\%$ after omission of Howatson *et al.* [8]. Overall, no single comparison drove the pooled estimate or the non-significant result.

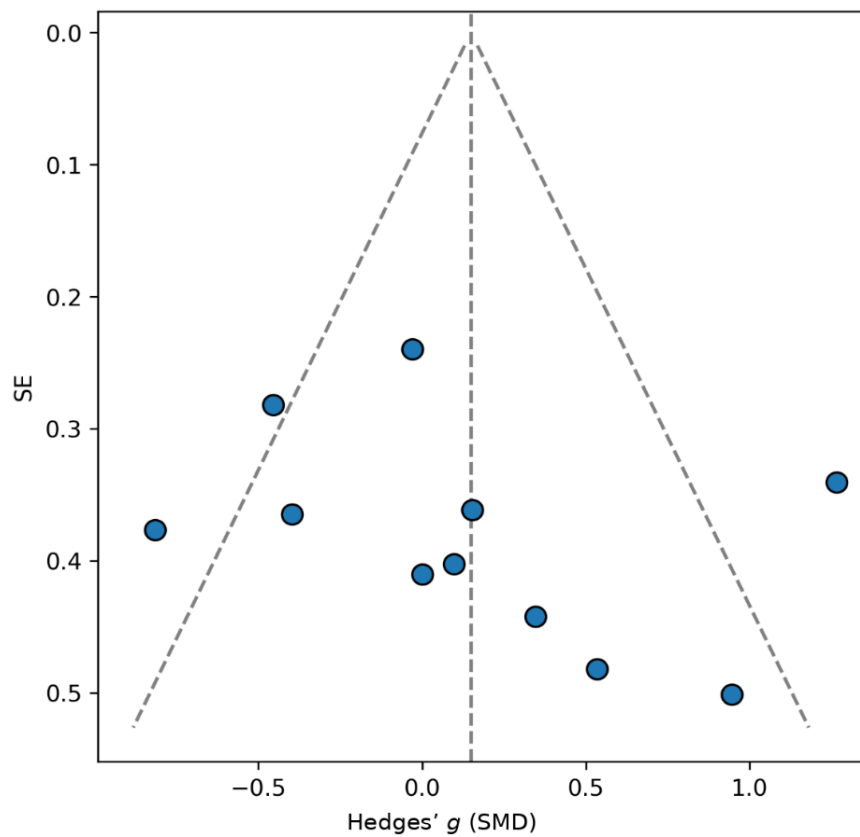


Figure S1 Funnel plot for overall sleep quality across all eligible comparisons. *Note.* Each point represents one eligible study comparison. The horizontal axis shows Hedges' g as the standardised mean difference (SMD); positive values indicate improved sleep with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Egger's test: $P = 0.330$. SE, standard error; SMD, standardised mean difference.

2. Overall Sleep Quality: Insomnia-Only Subgroup

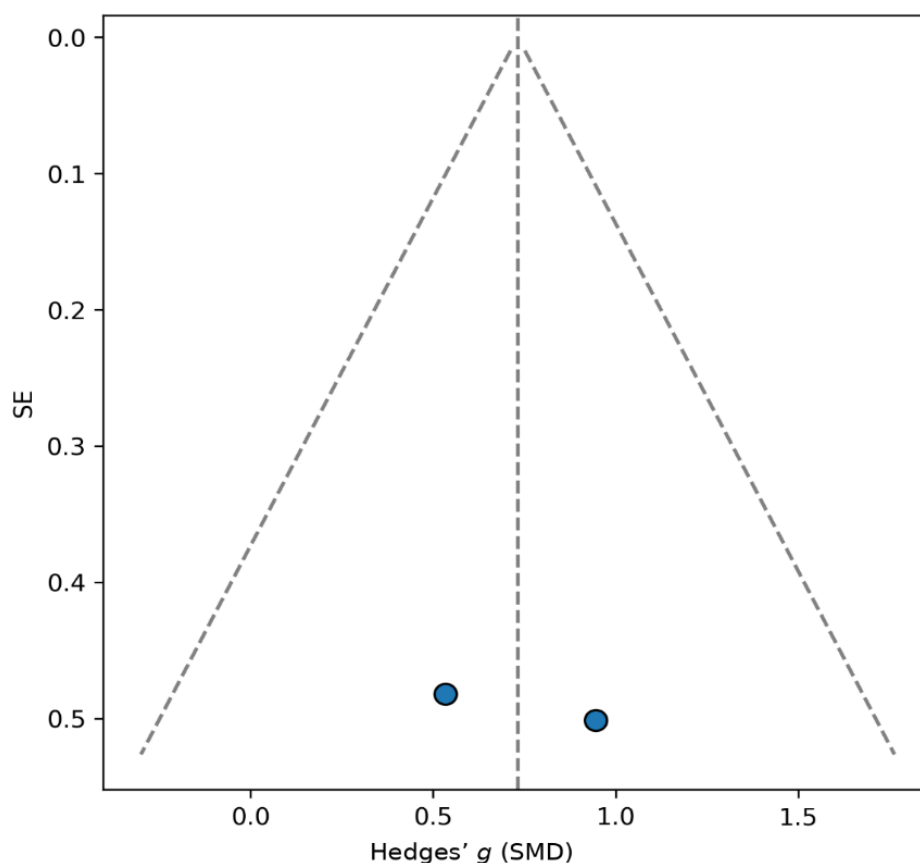


Figure S2 Funnel plot for overall sleep quality in participants with insomnia. *Note.* Each point represents one insomnia trial. The horizontal axis shows Hedges' g as the standardised mean difference (SMD); positive values indicate improved sleep with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Because only two trials were available, the plot is descriptive and cannot reliably assess small-study effects; Egger's test was not conducted. SE, standard error; SMD, standardised mean difference.

3. Melatonin

Leave-one-out sensitivity analysis did not materially change the direction of the pooled melatonin effect, which consistently favoured tart cherry supplementation. Every pooled estimate remained non-significant, and all 95% CIs crossed zero. The pooled estimates were Hedges' $g = 0.2897$ after omission of Hillman *et al.* [4] (juice), Hedges' $g = 0.2245$ after omission of Hillman *et al.* [4] (capsules), Hedges' $g = 0.3443$ after omission of Howatson *et al.* [8], and Hedges' $g = 0.2259$ after omission of Chung *et al.* [9]. Heterogeneity was absent in every iteration ($\tau^2 = 0.0000$; $I^2 = 0.0000\%$). Full confidence intervals and P -values are reported in Table S3.

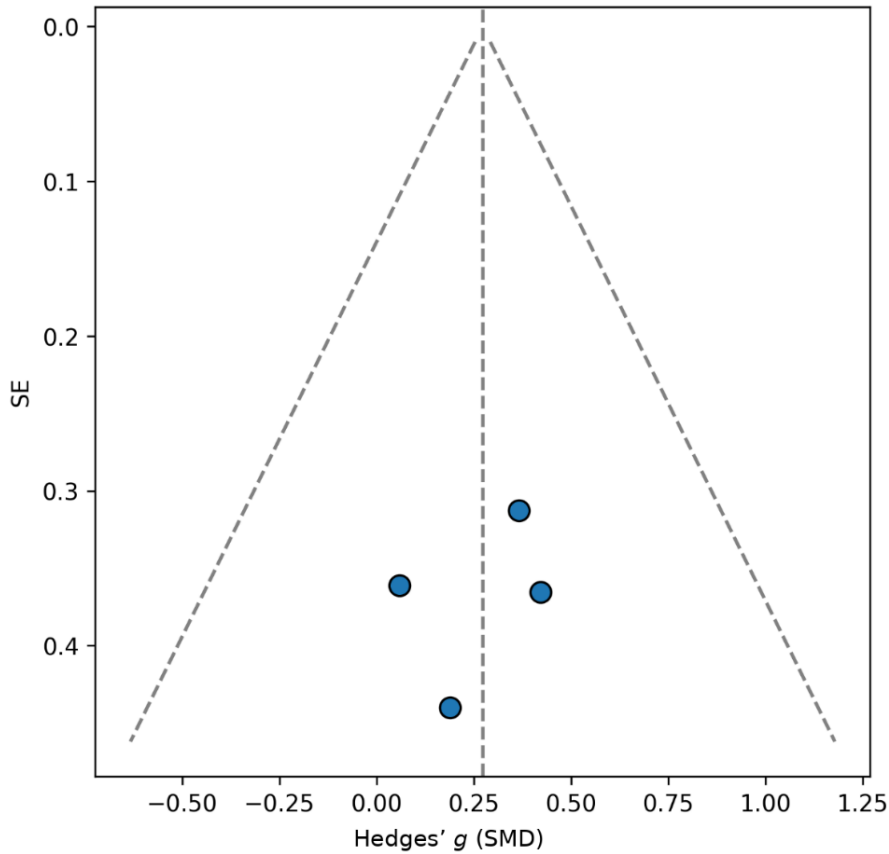


Figure S3 Funnel plot for melatonin. *Note.* Each point represents one eligible study comparison. The horizontal axis shows Hedges’ *g* as the standardised mean difference (SMD); positive values indicate a greater increase in melatonin with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Egger’s test: *P* = 0.601. SE, standard error; SMD, standardised mean difference.

Table S3 Leave-one-out sensitivity analysis for melatonin.

Study comparison omitted	Pooled Hedges’ <i>g</i>	95% CI lower	95% CI upper	<i>P</i>	τ^2	<i>I</i> ² (%)
Hillman <i>et al.</i> [4] (juice)	0.2897	-0.0993	0.6787	0.1444	0.0000	0.0000
Hillman <i>et al.</i> [4] (capsules)	0.2245	-0.1837	0.6327	0.2810	0.0000	0.0000
Howatson <i>et al.</i> [8]	0.3443	-0.0654	0.7540	0.0995	0.0000	0.0000
Chung <i>et al.</i> [9]	0.2259	-0.2090	0.6607	0.3086	0.0000	0.0000

Note. Each row presents the pooled Paule-Mandel random-effects estimate after omission of the named comparison. Positive Hedges’ *g* values indicate a greater increase in melatonin with tart cherry supplementation. CI, confidence interval; *I*², percentage of variability attributable to between-study heterogeneity; *P*, two-sided probability value; τ^2 , estimated between-study variance.

4. TNF- α

Only two studies contributed to this outcome. Leave-one-out sensitivity analysis and Egger's test for small-study effects were therefore not conducted.

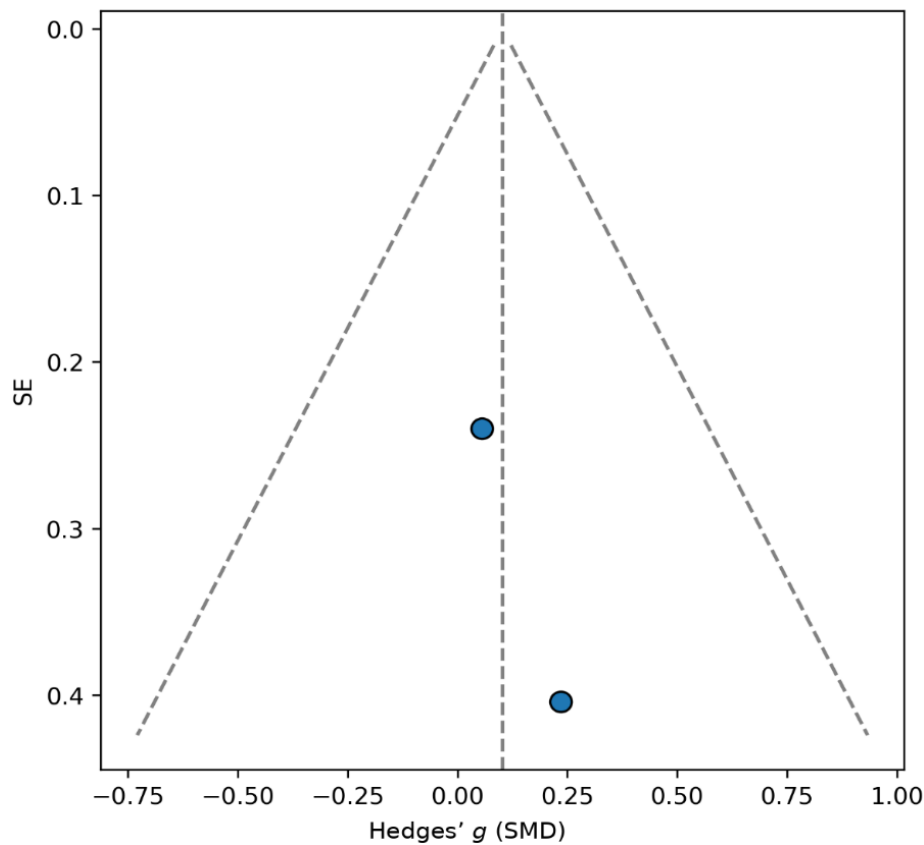


Figure S4 Funnel plot for tumour necrosis factor alpha (TNF- α). *Note.* Each point represents one eligible study comparison. The horizontal axis shows Hedges' g as the standardised mean difference (SMD); negative values indicate a greater reduction in TNF- α with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Because only two studies were available, the plot is descriptive and cannot reliably assess small-study effects; Egger's test was not conducted. TNF- α , tumour necrosis factor alpha; SE, standard error; SMD, standardised mean difference.

5. CRP

Only two studies contributed to this outcome. Leave-one-out sensitivity analysis and Egger's test for small-study effects were therefore not conducted.

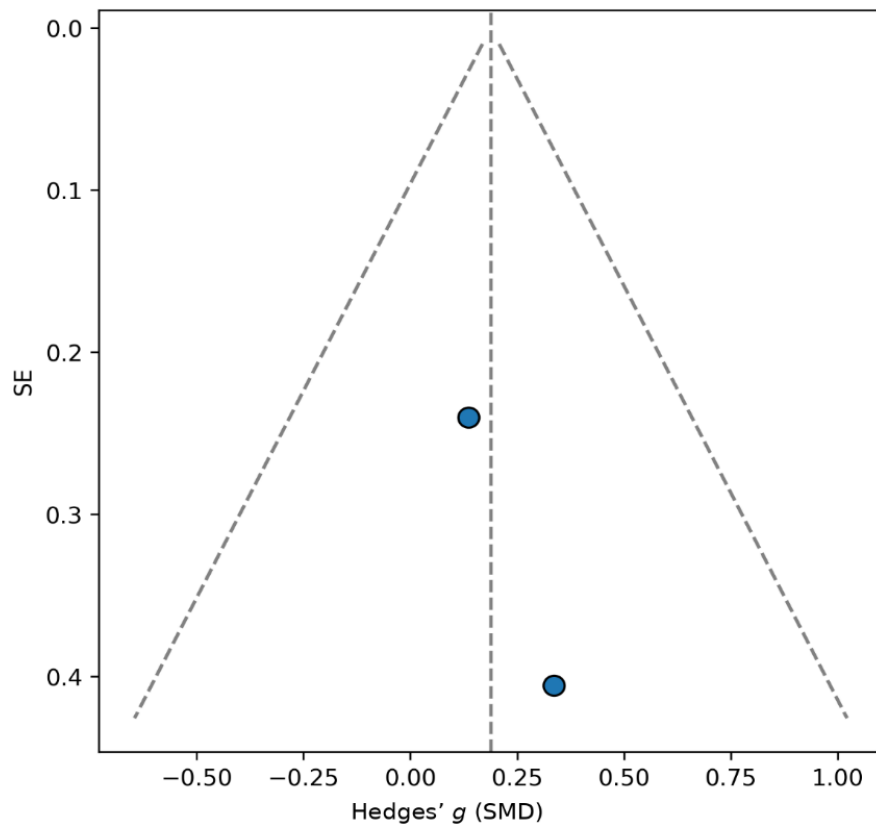


Figure S5 Funnel plot for C-reactive protein (CRP). *Note.* Each point represents one eligible study comparison. The horizontal axis shows Hedges' g as the standardised mean difference (SMD); negative values indicate a greater reduction in CRP with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Because only two studies were available, the plot is descriptive and cannot reliably assess small-study effects; Egger's test was not conducted. CRP, C-reactive protein; SE, standard error; SMD, standardised mean difference.

6. IL-6

Only two studies contributed to this outcome. Leave-one-out sensitivity analysis and Egger's test for small-study effects were therefore not conducted.

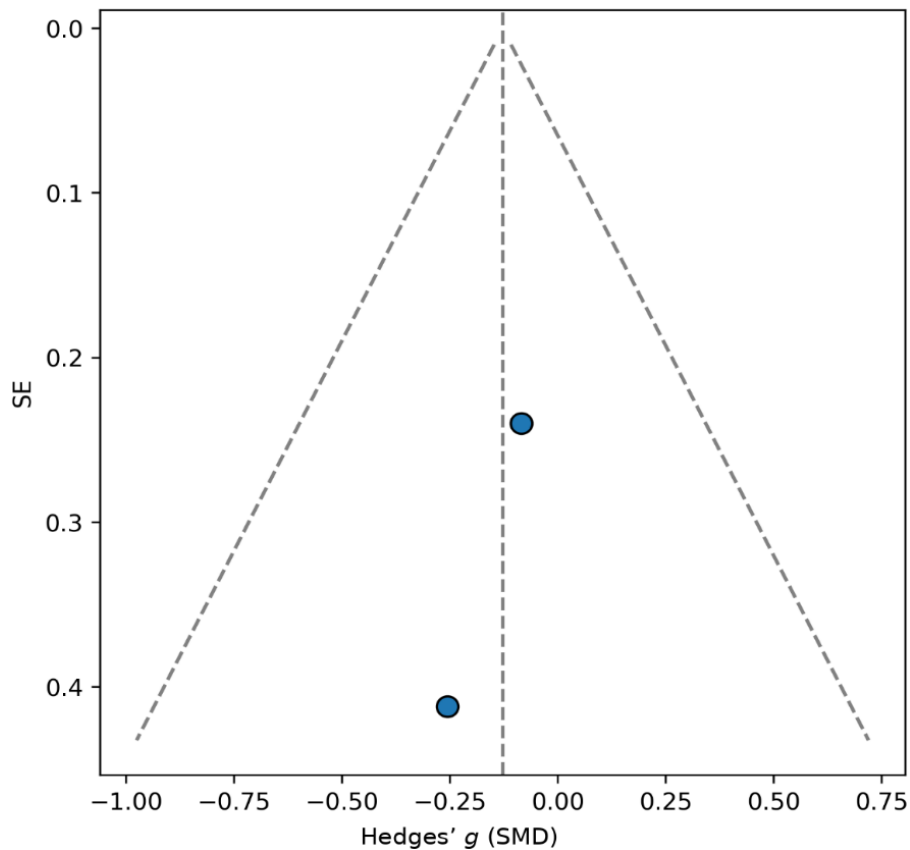


Figure S6 Funnel plot for interleukin 6 (IL-6). *Note.* Each point represents one eligible study comparison. The horizontal axis shows Hedges' g as the standardised mean difference (SMD); negative values indicate a greater reduction in IL-6 with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Because only two studies were available, the plot is descriptive and cannot reliably assess small-study effects; Egger's test was not conducted. IL-6, interleukin 6; SE, standard error; SMD, standardised mean difference.

7. IL-8

Only two studies contributed to this outcome. Leave-one-out sensitivity analysis and Egger's test for small-study effects were therefore not conducted.

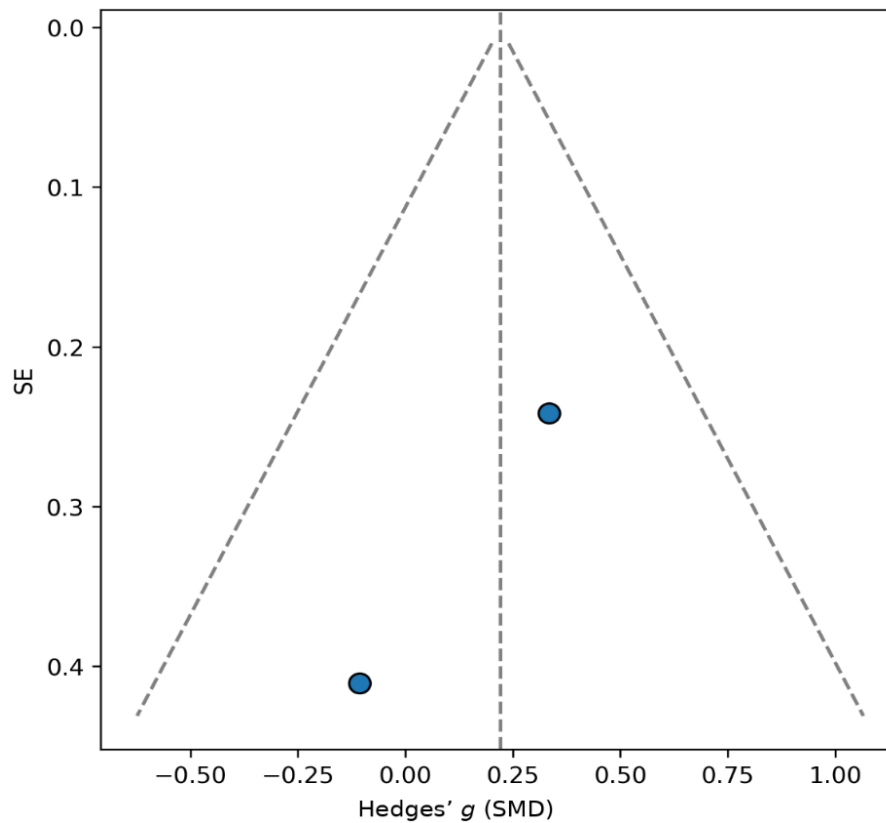


Figure S7 Funnel plot for interleukin 8 (IL-8). *Note.* Each point represents one eligible study comparison. The horizontal axis shows Hedges' g as the standardised mean difference (SMD); negative values indicate a greater reduction in IL-8 with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Because only two studies were available, the plot is descriptive and cannot reliably assess small-study effects; Egger's test was not conducted. IL-8, interleukin 8; SE, standard error; SMD, standardised mean difference.

8. IL-10

Only two studies contributed to this outcome. Leave-one-out sensitivity analysis and Egger's test for small-study effects were therefore not conducted.

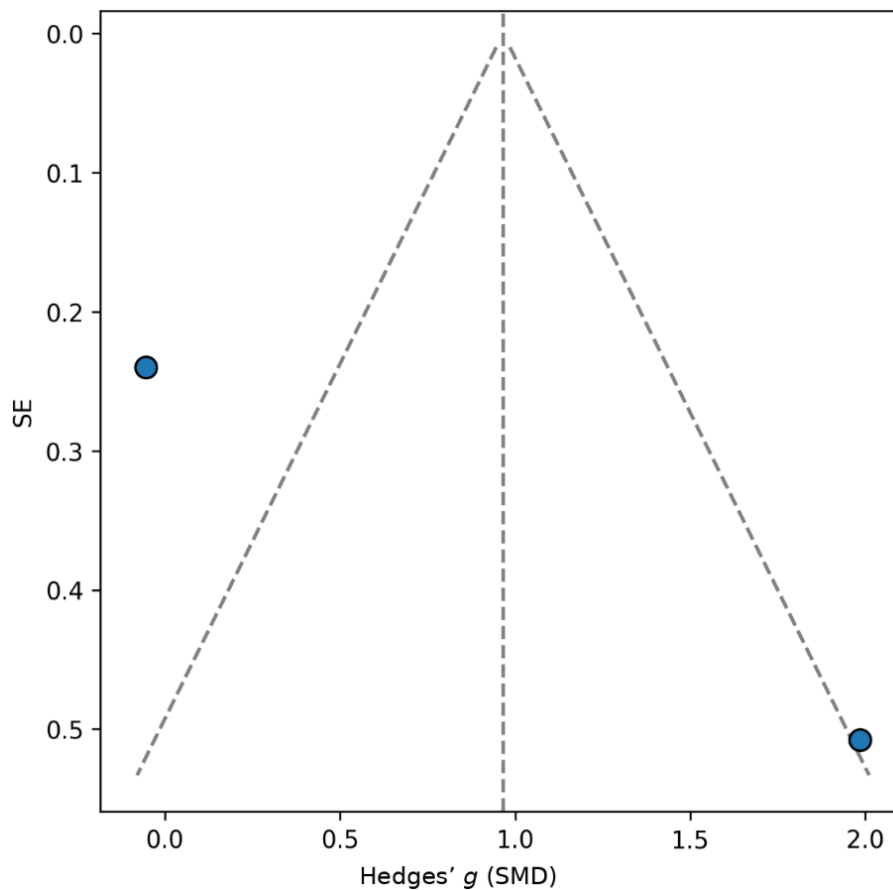


Figure S8 Funnel plot for interleukin 10 (IL-10). *Note.* Each point represents one eligible study comparison. The horizontal axis shows Hedges' g as the standardised mean difference (SMD); negative values indicate a greater reduction in IL-10 with tart cherry supplementation. The vertical axis shows the standard error (SE). The vertical dashed line indicates the pooled effect estimate, and the diagonal dashed lines indicate approximate 95% pseudo-confidence limits. Because only two studies were available, the plot is descriptive and cannot reliably assess small-study effects; Egger's test was not conducted. IL-10, interleukin 10; SE, standard error; SMD, standardised mean difference.

References

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10. Pigeon WR, Carr M, Gorman C, Perlis ML. Effects of a tart cherry juice beverage on the sleep of older adults with insomnia: A pilot study. *J Med Food*. 2010; 13: 579-583.