Supplementary Material Content

A systematic review and meta-analysis of the association of dietary diversity with undernutrition in school-aged children.

Table S1. Search strategy and terms.

Database	PubMed (n=736)	Scopus (n=3969)	Web of science (n=771)
Date	8th August 2022	8th August 2022	8th August 2022
strategy	((#1) AND (2))	((#1) AND (2))	((#1) AND (2))
#1	("Dietary diversity"[All Fields] OR "dietary diversity score"[All Fields] OR "dietary score"[All Fields] OR "DDS"[All Fields] OR "diversity score"[All Fields] OR "diet diversity"[All Fields] OR "household dietary diversity"[All Fields])	(ALL ("Dietary diversity") OR ALL ("dietary diversity score") OR ("DDS") OR ALL ("diversity score") OR ALL ("diet diversity") OR ALL ("household dietary diversity"))	TS=("Dietary diversity" OR "dietary diversity score" OR "DDS" OR "diversity score" OR "diet diversity" OR "household dietary diversity")
#2	("wasting"[All Fields] OR ("growth disorders"[MeSH Terms] OR "growth disorders"[All Fields] OR "stunting"[All Fields] OR "stunted"[All Fields]) OR ("malnutrition"[MeSH Terms] OR "malnutrition"[All Fields] OR "malnutrition s"[All Fields] OR "malnutritional"[All Fields] OR "malnutritions"[All Fields]) OR "under nutrition"[All Fields] OR "nutrition disorder"[All Fields] OR ("thinness"[MeSH Terms] OR ("wasting"[All Fields] OR ("growth disorders"[MeSH Terms] OR "growth disorders"[All Fields] OR "stunting"[All Fields] OR "stunted"[All Fields]) OR ("malnutrition"[MeSH Terms] OR "malnutrition"[All Fields] OR "malnutrition s"[All Fields] OR "malnutritional"[All Fields] OR "malnutritions"[All Fields]) OR "under nutrition"[All Fields] OR "nutrition disorder"[All Fields] OR ("thinness"[MeSH Terms] OR "thinness"[All Fields] OR "underweight"[All Fields] OR "underweights"[All Fields]) OR ("growth disorders"[MeSH Terms] OR ("growth"[All Fields] AND "disorders"[All Fields]) OR "growth disorders"[All Fields] OR "stunting"[All Fields] OR "stunted"[All Fields]) OR "stunted growth"[All Fields] OR ("body height"[MeSH Terms] OR ("body"[All Fields]	(ALL ("wasting") OR ALL ("growth disorders") OR ALL ("stunting") OR ALL ("stunted") OR ALL ("growth disorder") OR ALL ("malnutrition") OR ALL ("under nutrition") OR ALL ("nutrition disorder") OR ALL ("thinness") OR ALL ("underweight") OR ALL ("stunted growth") OR ALL ("body height") OR ALL ("height for age") OR ALL ("weight for height") OR ALL ("weight for age"))	TS=("wasting" OR "growth disorders" OR "stunting" OR "stunted" OR "growth disorder" OR "malnutrition" OR "under nutrition" OR "nutrition disorder" OR "thinness" OR "underweight" OR "stunted growth" OR "body height" OR "height for age" OR "weight for height" OR "weight for age")

Table S2. Quality assessment for individual studies included in the meta-analysis.

Reference	Selection				Comparability	Outcome		score
Author, year	Representativeness of the sample	Sample size	Non-respondents	Ascertainment of the exposure	Confounding factors are controlled	Assessment of the outcome	Statistical test	Total
Adeomi et al. 2022	1	1	1	2	2	2	1	10
Mulu Birru et al 2021	1	1	1	2	2	2	1	10
Mersha et al 2021	1	1	1	2	2	2	1	10
Patill et al. 2021	1	1	0	2	0	2	1	7
Yasuoka et al 2020	1	1	1	2	2	0	0	8
Shiferaw et al 2020	1	1	1	2	0	1	1	7
Kahssay et al 2020	1	1	1	2	2	2	1	10
Gezahegn et al 2020	1	1	1	2	2	2	1	10
Tariku et al 2020	1	1	1	2	0	2	0	7
Jikamo et al 2019	1	1	1	2	2	2	1	10
Getaneh et al 2019	1	1	1	2	2	2	1	10
Engidaw et al 2019	1	1	0	2	1	2	1	8
Belay et al 2019	1	1	1	2	2	0	1	8
Aiga et al 2019	1	1	1	2	2	2	1	10
Tariku et al 2018	1	1	1	2	2	2	1	10
Radhika et al 2018	1	1	1	2	1	0	1	8
Getachew et al 2017	1	1	1	2	2	2	1	10
Wassie et al 2015	1	1	1	2	2	2	1	10
Darapheak et al 2013	1	0	1	2	2	2	1	9
Niranjala et al 2011	1	0	1	2	2	2	1	9

Table S3. GRADE evidence table for the association dietary diversity and undernutrition.

Certainty assessment							No of patients	Effect		Certainty	Importance
No of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	population	Relative (95% CI)	Absolute (95% CI)		
Stunting											
13	observational studies	not serious	not serious	not serious	Serious [a]	publication bias strongly suspected	8539	**OR 1.43** (1.08 to 1.89)	**1 fewer per 1,000** (from 2 fewer to 1 fewer)	⊕◯◯◯ Very low	IMPORTANT
Thinness											
10	observational studies	not serious	Serious [b]	not serious	very serious [a]	none	9434	**OR 1.10** (0.81 to 1.49)	**1 fewer per 1,000** (from 1 fewer to 1 fewer)	⊕◯◯◯ Very low	IMPORTANT
Wasting											
2	observational studies	not serious	not serious	not serious	not serious	strong association	1004	**OR 2.18** (1.41 to 3.36)	**2 fewer per 1,000** (from 3 fewer to 1 fewer)	⊕⊕⊕◯ Moderate	IMPORTANT

CI: confidence interval; **OR:** odds ratio

Explanation:

a : Serious imprecision since the 95% confidence intervals includes no effect (RR of 1.00), but fails to exclude important harm (RR of >1.25). Downgraded.

b: Serious inconsistency since I^2 = 79%, Phet <0.001, that was largely unexplained in pre-specified subgroup and sensitivity analyses. Downgraded.

Table S4: List of excluded studies with the exclusion results.

list of studies excluded	exclusion reason.
Geda et al, 2021[1], Yoseph et al, 2020 [2] Workie et al, 2020 [3], Trisasmita et al, 2020 [4], Sheikh et al, 2020 [5], Rakotomananaet al, 2020 [6], Mutuku et al, 2020 [7], Modjadji et al, 2020 [8], Li et al, 2020 [9], Guyatt, et al, 2020 [10], Boulom et al, 2020 [11], Bogale, et al, 2020 [12], Walters et al, 2019 [13], Wondimagegne et al, 2019 [14], Nai et al, 2019 [15], Mya et al, 2019 [16], Mohammed et al, 2019 [17], Meshram et al, 2019 [18], Malako et al, 2019 [19], Kim et al, 2019 [20], Khamis et al, 2019 [21], Kang et al, 2019 [22], Hein et al, 2019 [23], Girma et al, 2019 [24], Bosha et al, 2019 [25], Sié et al, 2018 [4126], MakamtoSobgui et al, 2018 [27], Harding et al, 2018 [28], Gosdin et al, 2018 [29], Campbell et al, 2018 [30], Borkotoky et al, 2018 [31], Berhanu et al, 2018 [32], Ahmad et al, 2018 [33], Aditi Krishna et al, 2018 [34], Wondafrash et al, 2017 [35], Wang et al, 2017 [36], Tariku et al, 2017 [37], Tariku et al, 2017 [38], Mahmudiono et al, 2017 [39], Krasevec et al, 2017 [40], Kim et al, 2017 [41], Choudhury et al, 2017 [42], Chandrasekhar et al, 2017 [43], Balalian et al, 2017 [44], Ali et al, 2017 [45], Abate et al, 2017 [46], Udoh et al, 2016 [47], Tariku et al, 2016 [48], Ocampo-Guirindola et al, 2016 [49], Maradzika et al, 2016 [50], Altare et al, 2016 [51], Aguayo et al, 2016 [52], Rose et al, 2015 [53], McDonald et al, 2015 [54], Fekadu et al, 2015 [55], Bentley et al, 2015 [56], Bukania et al, 2014 [57], Rah et al, 2010 [58], Marriott et al, 2010 [59], Nurhayati et al, 2020 [60], Hintsa et al, 2019 [61], Berhe et al, 2019 [62], Paudel et al, 2012 [63], Belayneh et al, 2020 [64], Islam et al, 2018 , Kamenju et al, 2017 [65]	All these studies were done in the range of under 5 years.

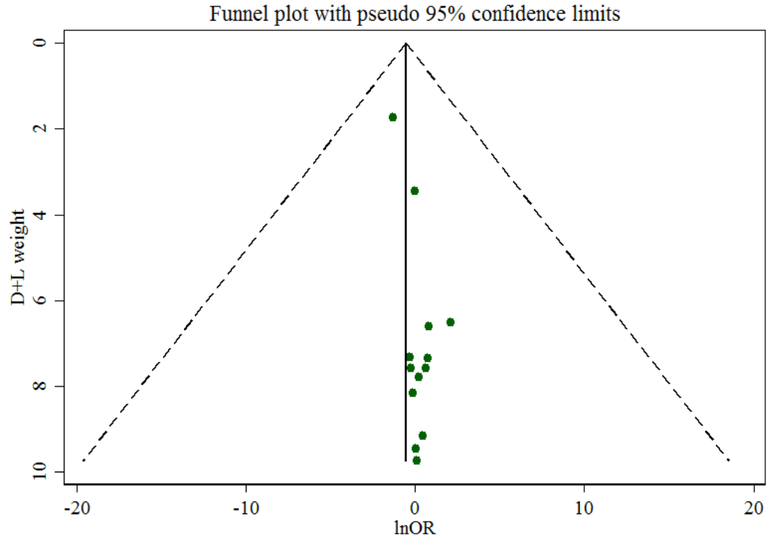

Figure S1. Funnel plot for the association between dietary diversity and stunting.

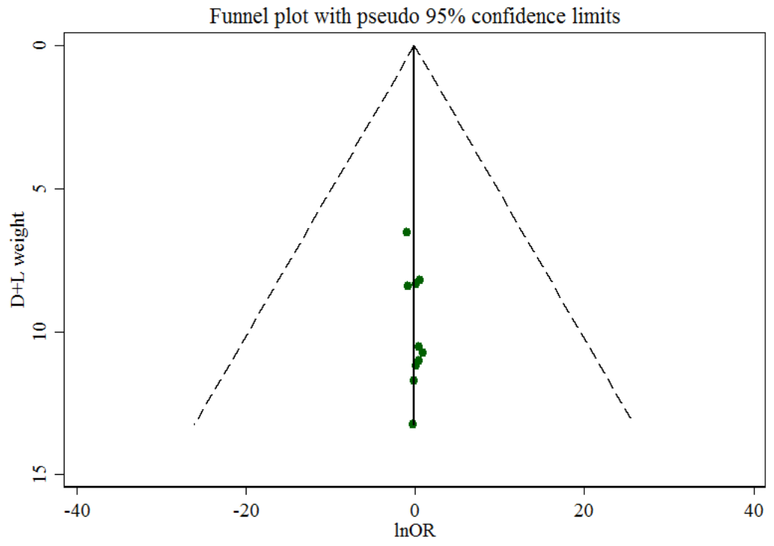

Figure S2. Funnel plot for the association between dietary diversity and thinness.

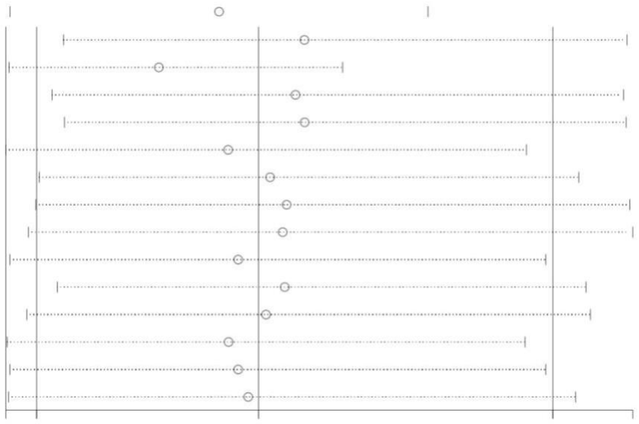

Figure S3. Meta influence for the association between dietary diversity and stunting.

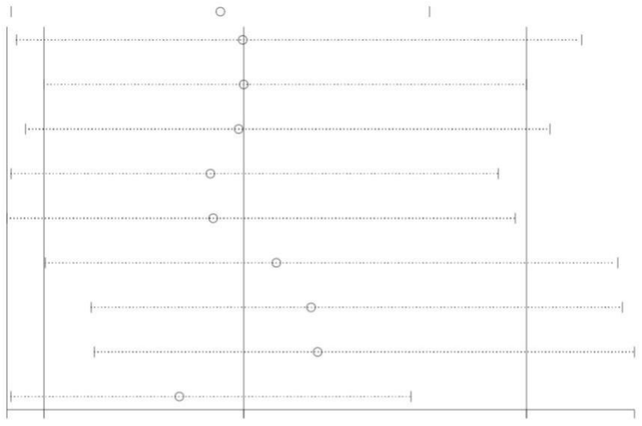

Figure S4. Meta influence for the association between dietary diversity and thinness.

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