ANH2023
Agriculture, Nutrition and Health Academy Week

HEALTHIER DIETS ASSOCIATED WITH BETTER MENTAL HEALTH IN LOW- AND MIDDLE-INCOME COUNTRIES: A META-ANALYSIS

METHODOLOGY

Systematic evidence and gap map of research linking food security and nutrition to mental health
Created by the ANH Academy Mental Health Working Group, led by the Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA) Programme, London School of Hygiene & Tropical Medicine, together with the Global Mental Health Lab, Teachers College, Columbia University.

n=1945

Studies on…
HEALTHY DIETS and COMMON MENTAL DISORDERS
Random effects models with a Fisher r-to-z transformed correlation coefficient outcome was fitted for each group of studies

Depression   **Anxiety**   **Stress**
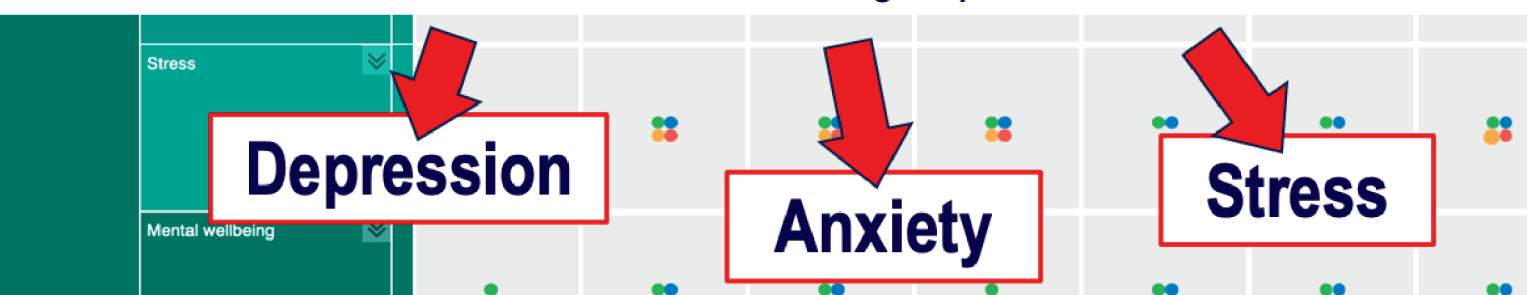
We examined heterogeneity among studies, outliers (and their potential influence on results), and bias

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BACKGROUND

Diet quality is known to impact long-term health outcomes such as diabetes and cardiovascular health. However, less is known about the empirical links between healthy diets and common mental disorders (CMDs), especially in Low- and Middle-Income Countries (LMICs).
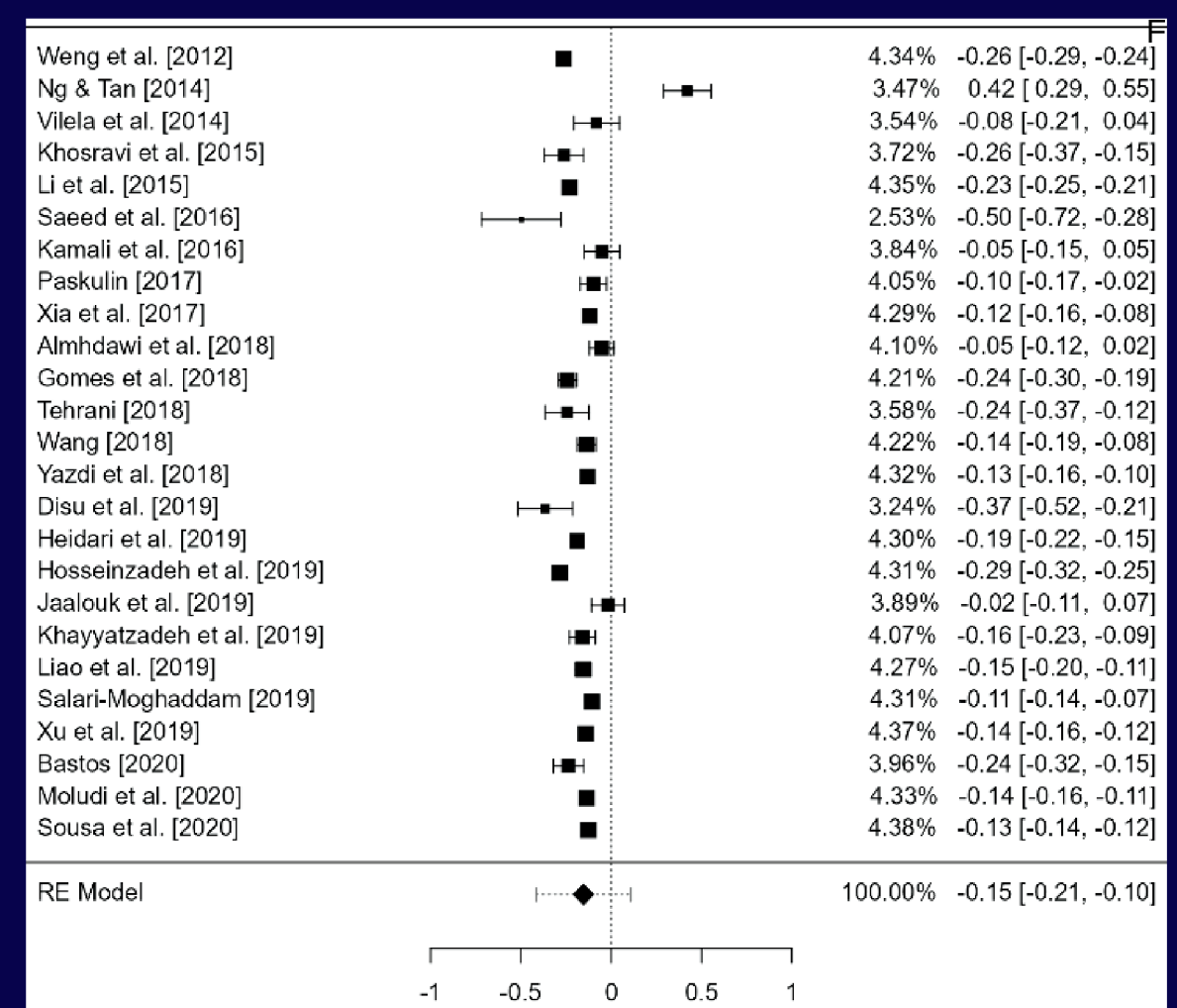
AIM

Our aim was to provide a pooled effect estimate of the association between healthy diets and mental health in LMICs, where the distribution of these burdens is changing fastest.

RESULTS

Forest Plot of studies (n=25) showing associations between healthy diets and depression. Coefficients (effect sizes) are transformed into standard deviations to show the average difference between groups. Plots to the left of zero are 'protective', i.e. healthy diets associated with less depressive symptoms, the middle line is no effect, and to the right of 0, plots show healthy diets are associated with depression. Effects are modest and heterogeneous, but the direction of effects is consistent, apart from one outlier.

	Estimate	SE	Z	p	CI Lower	CI Upper
Depression: 25 Studies						
Intercept*	-0.153	0.0274	-5.58	< .001	-0.207	-0.099
Anxiety: 11 Studies						
Intercept*	-0.0862	0.0181	-4.76	< .001	-0.122	-0.051
Stress: 8 Studies						
Intercept*	-0.0898	0.0191	-4.70	< .001	-0.126	-0.052
Fisher r-to-z transformed correlation coefficients						

Pooled effects from studies examining associations between healthy diets and depression, anxiety and stress, respectively. Correlation coefficients are transformed into standard deviations. The pooled estimates from all three groups show that healthy diets are associated with less mental health symptoms, although effect sizes are modest. The results are unlikely due to chance.

Study		Weight	Estimate [CI]
Weng et al. [2012]		4.34%	-0.26 [-0.29, -0.24]
Ng & Tan [2014]		3.47%	0.42 [0.29, 0.55]
Vilela et al. [2014]		3.54%	-0.08 [-0.21, 0.04]
Khosravi et al. [2015]		3.72%	-0.26 [-0.37, -0.15]
Li et al. [2015]		4.35%	-0.23 [-0.25, -0.21]
Saeed et al. [2016]		2.53%	-0.50 [-0.72, -0.28]
Kamali et al. [2016]		3.84%	-0.05 [-0.15, 0.05]
Paskulin [2017]		4.05%	-0.10 [-0.17, -0.02]
Xia et al. [2017]		4.29%	-0.12 [-0.16, -0.08]
Almhdawi et al. [2018]		4.10%	-0.05 [-0.12, 0.02]
Gomes et al. [2018]		4.21%	-0.24 [-0.30, -0.19]
Tehrani [2018]		3.58%	-0.24 [-0.37, -0.12]
Wang [2018]		4.22%	-0.14 [-0.19, -0.08]
Yazdi et al. [2018]		4.32%	-0.13 [-0.16, -0.10]
Disu et al. [2019]		3.24%	-0.37 [-0.52, -0.21]
Heidari et al. [2019]		4.30%	-0.19 [-0.22, -0.15]
Hosseinzadeh et al. [2019]		4.31%	-0.29 [-0.32, -0.25]
Jaalouk et al. [2019]		3.89%	-0.02 [-0.11, 0.07]
Khayyatzadeh et al. [2019]		4.07%	-0.16 [-0.23, -0.09]
Liao et al. [2019]		4.27%	-0.15 [-0.20, -0.11]
Salari-Moghaddam [2019]		4.31%	-0.11 [-0.14, -0.07]
Xu et al. [2019]		4.37%	-0.14 [-0.16, -0.12]
Bastos [2020]		3.96%	-0.24 [-0.32, -0.15]
Moludi et al. [2020]		4.33%	-0.14 [-0.16, -0.11]
Sousa et al. [2020]		4.38%	-0.13 [-0.14, -0.12]
RE Model		100.00%	-0.15 [-0.21, -0.10]

CONCLUSION

Despite heterogeneity in studies, there was strong and consistent evidence that healthier diets are linked to fewer symptoms of depression, anxiety, and stress. These are the first pooled estimates of these relationships in LMICs, and can guide policies, programmes, and future research.

REFERENCES

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