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Original Investigation

Ketogenic Diets and Depression and Anxiety A Systematic Review and Meta-Analysis

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Key Points

Question What are the associations between ketogenic diets (KDs) and mental health outcomes in adults, particularly depressive and anxiety symptoms?

Findings In this systematic review and meta-analysis of 50 studies, KDs were associated with small to moderate improvements in depressive symptoms in randomized clinical trials and with larger improvements in quasi-experimental studies. No significant associations were found for anxiety in randomized clinical trials.

Meaning KDs show potential associations with reduced depressive symptoms, but evidence for anxiety is inconclusive; larger, high-quality trials are needed to clarify effectiveness and generalizability.

Abstract



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Importance Ketogenic diets (KDs) have been hypothesized to influence mental health through pathways involving mitochondrial function, inflammation, and neurotransmitters, but their therapeutic value in psychiatric populations remains uncertain.

Objective To assess the associations between KDs and mental health outcomes in adults, with a focus on depressive and anxiety symptoms.

Data Sources MEDLINE, Embase, and APA PsycINFO were searched on April 18, 2025. Additional studies were identified through manual searches and clinical trial registries.

Study Selection Studies involving adults aged 18 years or older receiving a KD (<26% energy from carbohydrates or <50 g/day) and assessed with validated psychiatric scales were eligible. Designs included randomized clinical trials (RCTs), quasi-experimental (QSE) studies, cross-sectional studies, case series, and case reports.

Data Extraction and Synthesis Data were extracted by 1 reviewer and verified by 2 others. Risk of bias was assessed using critical appraisal tools from the Joanna Briggs Institute. Random-effects meta-analyses were run separately for RCTs and QSEs.

Main Outcomes and Measures The primary outcome was changes in psychiatric symptom severity measured by standardized scales, reported as standardized mean differences (SMDs) or standardized mean change using change scores (SMCCs).

Results A total of 50 studies (41 718 participants) were included. Ten RCTs on KD for depressive symptoms vs control diets showed a significant association (SMD, -0.48 ; 95% CI, -0.87 to -0.10 ; $I^2 = 67.2\%$), with stronger associations in studies using ketone monitoring, nonobese participants, very low-carbohydrate interventions, and non-high-carbohydrate comparators. Nine RCTs on anxiety showed no significant association (SMD, -0.03 ; 95% CI, -0.18 to 0.12 ; $I^2 = 41\%$). In QSEs, 9 on depressive symptoms showed a consistent association (SMCC, -0.66 ; 95% CI, -0.83 to -0.50 ; $I^2 = 0\%$), and 6 on anxiety showed similar results (SMCC, -0.58 ; 95% CI, -0.81 to -0.36 ; $I^2 = 0\%$).

Conclusions and Relevance In this systematic review and meta-analysis, KDs were associated with modest improvements in depressive symptoms, particularly with biochemical ketosis verification, while anxiety evidence was inconclusive. Given heterogeneity, comparators, and short follow-up, well-powered trials with standardized, verified protocols, structured support, and prespecified outcomes are needed to confirm efficacy and durability.



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