LIFE Science Hub
JOURNAL OF SCIENCE
EXPANDING KNOWLEDGE ABOUT NUTRITION AND HEALTH

ORIGINAL RESEARCH
Volume 1, Issue 4, November 2026
ISSN 2845-7501

Diabetes risk: the role of curcumin and omega-3

D.ssa D. Iodice[1]

1 Biologist, Italy

1. ABSTRACT

A clinical study compared curcumin, omega-3, their combination, and a placebo over 12 weeks in people at high risk of type 2 diabetes. The curcumin studied was a standardized formulation, not culinary turmeric. It improved certain indirect indicators of insulin response without altering glycemia or glycated hemoglobin.The authors' summary describes a randomized, double-blind, placebo-controlled study. Eighty-one people were assigned to four groups, and 64 completed the analysis. The curcumin group received two daily tablets of Meriva®, for a stated intake of 180 mg of curcumin; other interventions included long-chain omega-3, a combination of the two products, or a double placebo. After 12 weeks, insulin sensitivity—the body's ability to respond to insulin—increased by 32.7 ± 10.3% with curcumin compared to placebo (P = 0.009). Fasting insulin also decreased in the curcumin group. Fasting glycemia and glycated hemoglobin, an indicator of average glucose levels over the previous months, did not show significant differences between groups. Omega-3 achieved the greatest reduction in triglycerides, equal to −16.4 ± 4.5% (P < 0.001). The combination did not demonstrate an additional benefit. The results therefore concern a specific product, dose, and population; they do not prove that turmeric used as a spice prevents or treats diabetes.

ONLINE ARTICLE

ARTICLE INFORMATION

Published: November 23, 2026
Updated: November 23, 2026

DOI 10.5281/zenodo.24470464

KEYWORDS

curcumina omega-3 rischio diabete studio
curcumina insulina a digiuno
curcumina trigliceridi trial
Meriva curcumina studio clinico
omega-3 curcumina glicemia
curcumina prediabete 12 settimane

MISSION

LIFE Science Hub – Journal of Science was founded with the aim of making scientific knowledge accessible without giving up methodological rigour, quality of sources and authoritativeness of content. The journal promotes the dissemination of knowledge in the health, nutrition, medical and longevity sciences, building a bridge between the world of research and society.

Through articles, reviews, in-depth analyses and expert contributions, the Journal champions evidence-based medicine and science, fostering a correct interpretation of scientific data and countering misinformation. Every piece of content is developed with the aim of translating the complexity of research into understandable, useful and applicable information, while keeping intact the principles of accuracy, transparency and scientific independence.

Free from political, industrial and commercial influence, the journal stands as an authoritative and independent editorial space, dedicated to promoting scientific culture, professional development and the growth of health awareness among the public.

2. WHAT THIS RESEARCH ANALYZED

The 2019 study by Thota and colleagues examined individuals between 30 and 70 years of age who were overweight or obese and presented markers consistent with high metabolic risk. The goal was to understand whether concentrated products, administered in a controlled manner, could change parameters linked to glucose metabolism.Participants received a placebo, curcumin, fish oil, or both. The researchers measured glycemia, insulin, glycated hemoglobin, lipids, and C-reactive protein. They also calculated HOMA2-IR and HOMA2-%S, indices derived from fasting glycemia and insulin that estimate insulin resistance and insulin sensitivity, respectively. These indices do not directly measure the effect of curcumin within cells.

3. WHAT RESULTS EMERGED FROM THE STUDY

The clearest result concerns the insulin response. In the curcumin group, insulin sensitivity increased by 32.7 ± 10.3% compared to the placebo (P = 0.009), while fasting insulin was significantly reduced compared to the placebo (P = 0.002). In simple terms, the data suggest a favorable change in some indirect indicators of insulin response in the short term.However, this signal did not translate into a significant reduction in fasting glycemia or glycated hemoglobin. Omega-3 showed the greatest reduction in triglycerides, –16.4 ± 4.5% (P < 0.001). The combination of curcumin and omega-3 did not produce proven additional benefits. Therefore, it is incorrect to interpret the result as evidence of diabetes prevention.

4. WHY THIS STUDY IS RELEVANT

This research is particularly useful for distinguishing a standardized extract from the culinary spice. Participants did not consume varying amounts of turmeric in their meals: they received a precise formulation with defined dosage, frequency, and controls. This makes the comparison more reliable, but it also limits its applicability to everyday cooking.The placebo-controlled, double-blind design reduces the risk that the expectations of participants and researchers could influence the results. Furthermore, the comparison between four groups allowed for the separate verification of curcumin, omega-3, and their combination. The relevant point remains limited: the observed effects belong to the specific product examined under the conditions of the study.

5. STUDY LIMITATIONS AND WHAT IT DOES NOT DEMONSTRATE

The final sample consisted of 64 people, and the follow-up lasted only 12 weeks. The study was primarily designed to detect changes in glycated hemoglobin, but this outcome did not improve significantly. The results regarding insulin and HOMA2-%S must therefore be interpreted as short-term metabolic signals, not as conclusive clinical outcomes.The participants had non-identical risk profiles, and some were taking medications or other supplements. Furthermore, Meriva® is a phospholipid-complexed formulation designed to modify the absorption of curcumin. The study does not demonstrate that every extract produces the same effects, nor that turmeric as a food ingredient has an equivalent result.

6. INDEPENDENT CONFIRMING EVIDENCE

A trial involving 84 people with prediabetes and overweight status compared curcumin, zinc, a combination of both, and a placebo over 90 days. All active groups showed improvements in certain glycemic parameters compared to the placebo. This supports the possibility that controlled formulations should be studied in humans for metabolic outcomes; however, the hypocaloric diet recommended to all participants and the presence of zinc prevent attributing every change solely to curcumin [1].Another randomized study of 80 overweight individuals with suboptimal fasting glycemia used a phytosomal formulation containing curcumin, phospholipids, phosphatidylserine, and piperine. After 56 days, fasting insulin and HOMA-IR decreased more significantly compared to the placebo. This confirms the decisive role of the formulation but does not isolate the effect of curcumin from the other components [2].In an acute crossover trial, 16 volunteers took 180 mg of curcumin before a standardized meal. The post-meal glycemic response and insulin demand were lower compared to the placebo. This is a consistent finding in the short term, but it involves healthy subjects, a single intake, and

does not address the risk of diabetes over time [3].

7. CONFLICTING EVIDENCE

A 12-week trial involving 100 people with type 2 diabetes compared nano-curcumin, omega-3, a combination of both, and a placebo. The combination reduced insulin levels but did not significantly change fasting glycemia, glycated hemoglobin, HOMA-IR, or QUICKI, an insulin sensitivity index. This result is relevant because it shows that the effect is not consistent across different populations, formulations, and measures considered [4].A systematic review with meta-analysis published in 2026 found that, in cohorts with diabetes, the aggregate effect on HOMA-IR was not significant: SMD −0.01, 95% confidence interval from −0.78 to 0.76, with very high heterogeneity. This does not negate the signal from the Thota study, but it reduces the certainty of a generalizable effect [5].

8. QUADRO COMPARATIVO E SINTESI DELLE EVIDENZE

External research shows variable results, influenced by formulation, population, duration, and associated interventions.

Quadro comparativo

Publication	Model and intervention	Main result	Relationship with the Thota study
Karandish et al., 2021 [1]	RCT, 84 people with prediabetes; 500 mg curcumin, zinc, combination, or placebo for 90 days	Improvements in multiple glycemic parameters in the active groups	Indirect confirmation; zinc, diet, and physical activity limit attribution to curcumin alone
Cicero et al., 2020 [2]	RCT, 80 overweight people; curcumin phytosome with co-ingredients for 56 days	Reduction in fasting insulin and HOMA-IR compared to placebo	Direct confirmation of the role of the concentrated formulation, not the spice
Thota et al., 2018 [3]	Crossover RCT, 16 volunteers; 180 mg of curcumin before a meal	Lower glycemic and insulin response after the meal	Partial and acute confirmation; healthy population and single dose
Asghari et al., 2024 [4]	RCT, 100 people with type 2 diabetes; nano-curcumin, omega-3, combination, or placebo	No significant difference for glycemia, glycated hemoglobin, HOMA-IR, and QUICKI	Discordant evidence; results dependent on clinical context and formulation
Kehinde et al., 2026 [5]	Systematic review and meta-analysis of RCTs in metabolic conditions	No reliable aggregate benefit on HOMA-IR in cohorts with diabetes	Synthesis discordance; high heterogeneity reduces overall certainty

9. SINTESI EDITORIALE E CONCLUSIONI

EDITORIAL CONCLUSION

The 2019 study by Thota and colleagues evaluated a standardized formulation of curcumin and omega-3, not the turmeric used in cooking. Over 12 weeks, curcumin improved certain indirect indices of insulin sensitivity and reduced fasting insulin, without producing significant differences in fasting glycemia or glycated hemoglobin. Omega-3 showed the most marked effect on triglycerides, while the combination did not provide a demonstrated advantage. Independent evidence confirms that concentrated products and specific formulations can modify certain metabolic markers in specific studies. However, other trials and a quantitative synthesis show null or highly variable results for insulin resistance. The most accurate interpretation is therefore limited: dosage, formulation technology, duration, population, and associated interventions matter. This work does not prove that dietary turmeric prevents diabetes, nor that supplements can replace prevention, nutrition, physical activity, or appropriate medical care.

Aggiornato al 24/11/2026. Questo contenuto riflette una sintesi divulgativa delle evidenze scientifiche al momento della pubblicazione e non sostituisce il parere medico.

10. TRANSPARENCY AND SCIENTIFIC RESPONSIBILITY

Artificial Intelligence was used solely as a tool for editorial and documentary support. All content, interpretations, bibliographic citations and conclusions have been verified, reviewed and approved by the author, who assumes full scientific responsibility for them.

The manuscript was also subjected to independent peer review prior to publication.

To ensure the greatest transparency, the complete history of the article, including the dates of submission, revision, acceptance and publication, as well as information on the peer review process, is available on the dedicated Article History page.

11. RIFERIMENTI BIBLIOGRAFICI

[1] **Effects of phytosomal curcumin on anthropometric parameters, insulin resistance, cortisolemia and non-alcoholic fatty liver disease indices: a double-blind, placebo-controlled clinical trial**
Cicero et al., 2020
European Journal of Nutrition
DOI: https://doi.org/10.1007/s00394-019-01916-7

[2] **Curcumin alleviates postprandial glycaemic response in healthy subjects: A cross-over, randomized controlled study**
Thota et al., 2018
Scientific Reports
DOI: https://doi.org/10.1038/s41598-018-32032-x

[3] **The effect of curcumin and high-content eicosapentaenoic acid supplementations in type 2 diabetes mellitus patients: a double-blinded randomized clinical trial**
Asghari et al., 2024
Nutrition & Diabetes
DOI: https://doi.org/10.1038/s41387-024-00274-6

[4] **Clinical Potential of Curcuma longa Linn. as Nutraceutical/Dietary Supplement for Metabolic Syndrome: Systematic Review and Meta-Analysis of Randomized Controlled Trials**
Kehinde et al., 2025
Foods
DOI: https://doi.org/10.3390/foods15010060

[5] **The effect of curcumin and zinc co supplementation on glycemic parameters in overweight or obese prediabetic subjects: A phase 2 randomized, placebo controlled trial with a multi arm, parallel group design**
Karandish et al., 2021
Phytotherapy Research
DOI: https://doi.org/10.1002/ptr.7136