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DASH Diet

The DASH diet is a dietary pattern whose effect on blood pressure has been studied the most. The most cited work in the field is a meta-analysis of randomised studies on blood pressure reduction. Endpoints such as cognition, gut or uric acid rest on a much narrower foundation — here the open question remains.

320

STUDIES IN
TOTAL

233

IN HUMANS

109

OF WHICH
CONTROLLED

1

IN ANIMALS

0

IN THE LAB

Figures from the IHR study database · Last updated 2026-10-04

How to Read This Dossier

ESTABLISHED

measured in humans, with a comparison group

PLAUSIBLE

supported by mechanism, animal studies or observation

HYPOTHESIS

a likely connection that still needs to be tested

DASH Diet at a Glance

ORIGIN:

The DASH diet is not a substance but a dietary pattern. The name stands for Dietary Approaches to Stop Hypertension, the designation under which the pattern was tested in studies. It is investigated as an intervention in comparison to other dietary patterns, in randomised studies and in observational studies; in addition, modified variants exist.

EVIDENCE BASE:

320 evaluated works · 109 controlled human studies · 124 observational studies · 29 review articles · 1 animal study · 0 cell culture studies

STRONGEST EVIDENCE:

- Blood pressure: A meta-analytic summary of randomised studies supports the blood-pressure-lowering effect in adults with and without hypertension (work 1, 5,545 participants).
- Metabolic risk: Systematic reviews and meta-analyses examine metabolic risk factors in chronic diseases as well as overweight in adolescents (works 10, 11).
- Diabetes and cancer: Review articles on adherence report a reduced risk for diabetes mellitus and for breast cancer (works 2, 3).
- Lipid profile: A GRADE-assessed review examines the lipid profile in overweight and obesity (work 4, 3,562 participants).
- Oxidative stress: A meta-analysis of randomised clinical studies tests oxidative stress parameters; the participant number is small at 317 (work 8).

LIMITATIONS:

- Cognition and gut: Few controlled works exist in both areas; a frequently cited study on lifestyle and neurocognition does not test a DASH programme alone.
- Adherence: It is usually self-reported; a questionnaire score captures diet, health behaviour and educational proximity together.
- Periodontitis: The association comes from a cross-sectional study that shows concurrent associations and cannot prove an effect.

CLASSIFICATION:

The DASH diet is a dietary pattern whose blood-pressure-lowering effect is best established; other endpoints are at the beginning of testing.

1. What the DASH Diet Is

The DASH diet is not a substance but a **dietary pattern**. The name derives from the designation Dietary Approaches to Stop Hypertension, under which the pattern was tested in studies. It is investigated as an **intervention** in comparison to other dietary patterns, in randomised studies as well as in observational studies in which the proximity of habitual diet to the specification is recorded as a score and related to disease risk. In addition, **modified variants** exist that are summarised in separate review articles. For therapeutic practice the diet is therefore not a prescription of a single active substance but a specification for food selection over a longer period; implementation, not the intake of a substance, is the actual subject of every investigation.

Decisive for the understanding of all works is that no **dose** can be stated for a pattern. Instead, **adherence** is measured, that is the proximity of actual diet to the specification. It is predominantly recorded with questionnaires and scores; one review article is devoted expressly to adherence and hypertension risk. Two things follow from this. First, observational studies answer a different question from controlled intervention studies: the one shows an **association**, the other tests the effect under prescribed diet. Second, the pattern can also be described by **metabolic profiles** of the serum; an untargeted metabolomic work assigns it its own profile. Whether such profiles map adherence more objectively than questionnaires is a testable open question.

2. How Reliable the Research Is

The controlled human studies are distributed unevenly. The focus clearly lies on **cardiovascular endpoints**; no other area reaches this breadth. Metabolic, safety, fatigue and inflammation follow. Clearly smaller groups form antioxidant parameters, cognition, gut, oncology and immune system. Some of the frequently cited works also come from health-services research, for example on heart failure or on self-management support in hypertension; these works examine the embedding of the pattern in care, not the pattern alone. For practice it follows that statements on blood pressure rest on a broad basis, statements on cognition, gut or immune system on individual works.

Methodologically the field is well positioned: several **meta-analyses of randomised studies** exist, the most-cited work is such an analysis on blood pressure, and systematic reviews on metabolic risk factors in chronic diseases, on oxidative stress, on overweight in adolescents and on modified variants of the pattern stand alongside. This is the most reliable form of summary. Three points act as limitations: the endpoints are heterogeneous, adherence is usually self-reported, and some observational studies cannot separate the dietary pattern from other lifestyle factors. Basic research and one animal study complete the picture; such findings are **preclinical** and carry no statement about application in humans.

Distribution of **controlled human studies** by application area — the numbers are not additive because one work can be assigned to several areas:

APPLICATION AREA	CONTROLLED STUDIES
Heart and circulation	100
Metabolism	56
Safety and tolerability	16

APPLICATION AREA	CONTROLLED STUDIES
Fatigue and stress	14
Inflammatory processes	13
Oxidative stress	7
Cognition and psyche	7
Gut and microbiome	5

Blood pressure is well tested — transfer to other endpoints is not

The thesis is simple: the degree of recognition of the DASH diet stems from a single endpoint group. The most-cited work in the field is a meta-analysis of randomised controlled studies on blood-pressure reduction in adults with and without hypertension; further review articles set the same focus on cardiovascular and metabolic topics.

PROVEN:

After several concordant randomised studies and their meta-analytic summary, the blood-pressure-lowering effect is the best established. Everything else is less tested by comparison, not refuted: review articles exist on oxidative stress, individual randomised evaluations on uric acid and vascular risk, few controlled studies on cognition and gut.

The second critical point is the

ADHERENCE MEASUREMENT

. Anyone who measures proximity to the specification with a questionnaire point value captures nutrition, health behaviour and educational proximity together; a low hypertension risk with high adherence is thus initially an **association**, not a tested effect. In controlled studies, on the other hand, the diet is specified, where the result carries more weight, but is more difficult to transfer to everyday life. **Hypothesis:** Part of the attributions comes from frequently cited works that do not test the pattern in isolation, for example a randomised study on a blood pressure app or a study on lifestyle and neurocognition. Which proportion of a result actually depends on the pattern would need to be clarified in a separate study.

3. What Is Frequently Claimed — and What the Data Provide

CLAIM	STUDY SITUATION
Blood pressure in hypertension	A meta-analytical summary of randomised studies supports the blood pressure-lowering effect in adults with and without hypertension; a controlled study also
Weight and metabolic risk	Systematic reviews and meta-analyses examine metabolic risk factors in chronic diseases and overweight in adolescents. They contribute summarily; individua
Cognition and exhaustion	Few controlled studies are available in both areas. A frequently cited randomised study on lifestyle and neurocognition does not examine a DASH programme al
Periodontitis	The association between dietary patterns and periodontitis originates from a cross-sectional study. A cross-sectional study shows concurrent associations and

4. The Most Robust Studies

Ordered by strength of evidence, not by familiarity: reviews and studies with many participants first. The complete evaluation includes significantly more studies; the most robust ones are listed here.

Controlled Studies in Humans

- ¹ Dietary Approaches to Stop Hypertension (DASH) Diet and Blood Pressure Reduction in Adults with and without Hypertension: A Systematic Review and ... (2020) — Übersichtsarbeit, 5.545 Teilnehmer
- ² Adherence to the Dietary Approaches to Stop Hypertension diet reduces the risk of breast cancer: A systematic review and meta-analysis (2022) — Übersichtsarbeit, 449.273 Teilnehmer
- ³ Adherence to the dietary approaches to stop hypertension diet reduces the risk of diabetes mellitus: a systematic review and dose-response ... (2024) — Übersichtsarbeit, 557.475 Teilnehmer
- ⁴ Effect of Dietary Approaches to Stop Hypertension (DASH) diet on lipid profile in individuals with overweight/ obesity: A GRADE-assessed systematic ... (2025) — Übersichtsarbeit, 3.562 Teilnehmer

- ⁵ Digital-Based Nutrition Interventions Employing the Dietary Approaches to Stop Hypertension (DASH) Diet: A Systematic Scoping Review (2025) — Übersichtsarbeit, 7.000 Teilnehmer
- ⁶ The effect of DASH diet on components of metabolic syndrome: a systematic review and meta-analysis of randomized controlled trials (2026) — Übersichtsarbeit, 1.062 Teilnehmer
- ⁷ Adherence to the Dietary Approaches to Stop Hypertension diet reduces the risk of diabetes mellitus: A systematic review and dose-response ... (2024) — Übersichtsarbeit, 557.475 Teilnehmer
- ⁸ Effect of DASH diet on oxidative stress parameters: A systematic review and meta-analysis of randomized clinical trials (2020) — Übersichtsarbeit, 317 Teilnehmer
- ⁹ Evaluating the impact of the Dietary Approaches to Stop Hypertension diet versus a calorie-restricted diet on metabolic dysfunction-associated ... (2025) — Übersichtsarbeit, 280 Teilnehmer
- ¹⁰ The effects of the Dietary Approaches to Stop Hypertension (DASH) diet on metabolic risk factors in patients with chronic disease: A systematic ... (2021) — Übersichtsarbeit
- ¹¹ Effects of the Dietary Approach to Stop Hypertension (DASH) diet on blood pressure, overweight and obesity in adolescents: A systematic review (2018) — Übersichtsarbeit
- ¹² Effects of the Modified DASH Diet on Adults With Elevated Blood Pressure or Hypertension: A Systematic Review and Meta-Analysis (2021) — Übersichtsarbeit
- ¹³ Effects of the Dietary Approaches to Stop Hypertension (DASH) on Pregnancy/Neonatal Outcomes and Maternal Glycemic Control: A Systematic Review and ... (2020) — Übersichtsarbeit
- ¹⁴ Dietary Approaches to Stop Hypertension (DASH) diet and mental well-being: a systematic review (2023) — Übersichtsarbeit
- Effect of dietary patterns on functional dyspepsia in adults: a systematic review (2025) — Systematic review
- ¹⁵ The Effect of Dietary Approaches to Stop Hypertension (DASH) Diet on Liver Enzyme Level in Adults: A GRADE-Assessed Systematic Review and ... (2025) — Systematic review
- Association between Dietary Pattern and Periodontitis-A Cross-Sectional Study (2021) — 6.209 participants
- ¹⁶ Dietary Approaches to Stop Hypertension (DASH) Score and Its Association with Sleep Quality in a National Survey of Middle-Aged and Older Men and ... (2020) — 3.941 participants
- ¹⁷ DASH (Dietary Approaches to Stop Hypertension) dietary pattern and maternal blood pressure in pregnancy (2020) — 511 participants
- ¹⁸ A Tailored Behavioral Intervention to Promote Adherence to the DASH Diet (2019) — 533 participants
- ¹⁹ Dietary Approaches to Stop Hypertension (DASH) for the primary and secondary prevention of cardiovascular diseases (2025) — 1.397 participants
- ²⁰ Compliance with the DASH diet and risk of all-cause and cardiovascular mortality in patients with myocardial infarction (2023) — 4.365 participants
- ²¹ Short-term effect of modest salt reduction combined with the CM-DASH diet on salt eating habits in hypertensive patients with type II diabetes: A ... (2021) — 3.114 participants
- ²² Serum untargeted metabolomic profile of the Dietary Approaches to Stop Hypertension (DASH) dietary pattern (2018) — 329 participants

5. Summary

PROVEN After several consistent randomised studies and their meta-analytical summary, the blood pressure-lowering effect is the best-established endpoint in the field; the most-cited work is a meta-analysis of randomised controlled trials in adults with and without hypertension (study 1, 5.545 participants). A controlled study also exists in adolescents with elevated values. The focus of controlled human research lies clearly on cardiovascular endpoints; no other area achieves this breadth. Everything else has been examined less, but not refuted.

PLAUSIBLE Reviews exist on oxidative stress, individual randomised evaluations on uric acid and vascular risk, and systematic reviews on metabolic risk factors in chronic diseases and on overweight in adolescents. **Hypothesis:** Some attributions derive from frequently cited works that do not test the pattern in isolation, such as a randomised study on a blood-pressure app or a study on lifestyle and neurocognition; the proportion of a result that actually depends on the pattern would need to be clarified in a dedicated study.

The first point to clarify would be adherence measurement: which measure maps actual nutrition so that observational and interventional studies become comparable? In controlled studies nutrition is prescribed; there the result carries more weight but transfers less readily to everyday life; observational studies show an association, not a tested effect. For cognition a randomised study is lacking that tests the pattern alone, with sufficient duration and a clinically relevant cognitive endpoint. It also remains open whether adherence and effect can be objectively mapped via serum metabolites and whether these markers agree with the questionnaire values.

6. What Remains Open

- **Adherence:** Which measure maps actual nutrition so that observational and interventional studies become comparable?
- **Cognition:** Which randomised study tests the pattern alone, with sufficient duration and a clinically relevant cognitive endpoint?
- **Metabolic profiles:** Can adherence and effect be objectively mapped via serum metabolites, and do these markers agree with the questionnaire values?

Frequently Asked Questions

How do I distinguish between observation and tested effect with the DASH diet?

Observational studies assign an adherence score to disease risk; they show an **association** into which other lifestyle factors also enter. Controlled studies prescribe the diet and test the effect. For blood pressure there is additionally a meta-analytical summary of randomised studies; for most other endpoints this synthesis is still pending.

What can be measured additionally when there is no dose concept?

A pattern cannot be stated in milligrams. What can be measured is proximity to the specification, that is adherence, and the endpoints themselves, for example blood pressure and metabolic values. Adherence is predominantly self-reported, which limits its informative value. Serum profiles could supply a more objective measure in future; as routine parameters they are not yet established.

What has been tested in people with chronic disease?

Systematic reviews and meta-analyses are available on this question that examine metabolic risk factors in chronic diseases, as well as studies on heart failure and on type 2 diabetes with prehypertension. These reviews pool heterogeneous studies; which patient group responds to what extent cannot be derived from them and remains an open question.

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International Health Research

Research, put in context. Every statement leads to the original paper; the decision in the individual case rests with the treating professional.
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