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Multivitamin and Mineral Supplementation for Adult Health and Disease Prevention: A Practical Clinical Guidance

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Abstract
Multivitamin and mineral supplementation has been evaluated for disease prevention, cognitive preservation, symptoms, functional performance and biological aging. This narrative review integrates major randomized trials with regional publications, observational studies and selected unpublished academic work. The Physicians' Health Study II demonstrated an 8% relative reduction in total cancer incidence and a reduction in cataract. The COSMOS cognitive studies demonstrated benefits in global cognition and episodic memory; a subsequent randomized ancillary analysis demonstrated slower progression of two epigenetic aging clocks. Selected antioxidant combinations reduced gastric cancer incidence or mortality in high risk populations. The principal broad spectrum prevention trials did not require dietary inadequacy or biochemical deficiency for enrollment, so deficiency should not be imposed retrospectively as a prerequisite for considering their results. Evidence nevertheless remains outcome specific: major cardiovascular events, incident dementia and overall survival have not been consistently improved by broad spectrum multivitamins. Smaller trials support improvements in selected measures of fatigue, stress, task performance and illness burden, although some tested products also contained nonvitamin ingredients. Clinical decisions should match the patient, intended outcome, formulation, dose and duration to the evidence. Supplementation is a reasonable option for selected adults similar to trial participants, including those without documented deficiency; the evidence does not establish an obligation for every adult to take a multivitamin.

Keywords: multivitamins, minerals, cancer prevention, cognition, dementia, cardiovascular disease, fatigue, biological aging

Clinical Question and Scope

The practical question is whether an adult who has no diagnosed vitamin deficiency should consider a daily multivitamin for better health. A useful answer requires more precision than a single verdict on "vitamins." Broad spectrum multivitamins, five nutrient antioxidant combinations and multivitamins containing ginseng or coenzyme Q10 represent different interventions. Their effects also differ across cancer, memory, vascular events, symptoms and survival. This review therefore organizes the evidence by the outcome that matters to the patient, and links favorable findings to the studied daily formulation. [1]

Preventive supplementation and treatment of a diagnosed deficiency are distinct clinical indications. Pregnancy, malabsorption, bariatric surgery and specific deficiency syndromes require their own protocols and fall outside the principal question here. The discussion concerns generally community dwelling adults, with additional attention to fatigue and demanding physical or cognitive activity. The practical recommendations below represent a clinical interpretation of this evidence rather than a universal guideline recommendation.

Evidence Identification and Interpretation

Publicly accessible scholarly web searches were conducted through 1 November 2026. Searches combined multivitamin, multimineral, supplementation and randomized trial with cancer, myocardial infarction, stroke, cognition, dementia, fatigue, performance, infection, mortality and epigenetic aging. English, Portuguese, Spanish, Chinese and Russian terms and domain directed searches were used. Alongside major journals and trial repositories, the search explored public records associated with CNKI, Chinese journals, Indian journals, RusMed, CyberLeninka, SciELO, BVS, Latin American institutional repositories, Korean publications, dissertations and conference proceedings. Accordingly, this is an expanded narrative review, not a reproducible systematic review or an exhaustive search of each named database.

Randomized comparisons carry the most weight for efficacy. Observational associations, within group changes and changes in biomarkers are identified as such. Favorable secondary or subgroup results are retained, with the relevant overall result stated alongside them. Multiple publications from one parent trial are not treated as independent replications. No pooled effect was calculated across dissimilar formulations. Where only an abstract or repository record was accessible, that limitation is identified in the study table. Product doses refer to the trial formulation, not a contemporary product with a similar name.

Tables 1A–1C summarize studies reporting favorable findings, including the populations evaluated, supplement formulations, daily doses where available, and clinical interpretation. Table 2 translates this evidence into practical decisions according to the patient's clinical goal.

Cancer Prevention

The Physicians' Health Study II (PHS II) randomized 14,641 male physicians aged 50 years or older. Over a median 11.2 years, daily multivitamin supplementation reduced total cancer incidence, excluding nonmelanoma skin cancer: hazard ratio (HR) 0.92, 95% confidence interval (CI) 0.86–0.998; P=0.044. Rates were 17.0 versus 18.3 cases per 1,000 person years. This was a statistically significant benefit for a primary clinical outcome. The relative reduction was 8%, with an absolute rate difference of 1.3 cases per 1,000 person years. [2]

COSMOS provided a second large randomized test, involving 21,442 older adults over a median 3.6 years. Total invasive cancer was not significantly reduced: HR 0.97, 95% CI 0.86–1.09. Although, lung cancer was lower in a secondary analysis, HR 0.62, 95% CI 0.42–0.92, without adjustment for multiple comparisons. The shorter follow-up, different sex distribution and different formulation may contribute to the contrast with PHS II, but none is an established explanation. The appropriate synthesis is that PHS II demonstrated a total cancer benefit and COSMOS did not confirm that endpoint within its observation period, although the COSMOS had evaluated invasive cancer. [3]

Other randomized trials show that micronutrient combinations can prevent clinically important cancer outcomes in particular settings. SU.VI.MAX tested vitamin C, vitamin E, beta-carotene, selenium and zinc in 13,017 adults for 7.5 years. Total cancer was not significantly reduced overall, but men had lower cancer incidence, relative risk (RR) 0.69, 95% CI 0.53–0.91, with a significant interaction by sex. Male mortality was also lower, RR 0.63, 95% CI 0.42–0.93, although the mortality interaction by sex was not significant. This supports the cancer finding in men without establishing a sex restricted mortality effect. [4]

The Shandong Intervention Trial provides a substantial additional positive result. Among 3,365 residents of a region with high gastric cancer risk, vitamin C, vitamin E and selenium were administered for 7.3 years within a factorial trial. At 22.3 years, vitamin assignment was associated with lower gastric cancer incidence, odds ratio (OR) 0.64, 95% CI 0.46–0.91, and gastric cancer mortality, HR 0.48, 95% CI 0.31–0.75. The results establish efficacy for this targeted combination in a high-risk setting; applicability to other formulations and risk levels requires separate evaluation. [5]

In the Linxian General Population Nutrition Intervention Trial, 29,584 adults were randomized in a factorial design. The selenium, vitamin E and beta-carotene combination reduced total mortality during the 5.25 year intervention, RR 0.91, 95% CI 0.84–0.99, and gastric cancer mortality, RR 0.79, 95% CI 0.64–0.99. Favorable effects remained evident at the 10-year postintervention analysis. At 25 years after treatment ended, the overall mortality benefit had disappeared and the cumulative gastric cancer estimate was attenuated. Thus, this trial demonstrates a benefit over defined periods, not permanent protection after a finite course. [6, 7, 8]

Clinically, these trials establish that positive cancer prevention evidence exists. The most directly applicable broad-spectrum evidence concerns men resembling PHS II participants. Antioxidant trials broaden the evidence but introduce different baseline risks and formulations. A multivitamin discussion can acknowledge those benefits while retaining screening, tobacco cessation and other established prevention measures as part of the same care plan.

Myocardial Infarction, Stroke and Blood Pressure

The large broad-spectrum trials did not demonstrate prevention of major cardiovascular events. PHS II reported HR 1.01, 95% CI 0.91–1.10; COSMOS reported HR 0.98, 95% CI 0.86–1.12. A favorable PHS II secondary finding for fatal myocardial infarction, HR 0.61, 95% CI 0.38–0.995, should be reported accurately alongside the null major event endpoint. It is insufficient by itself to establish a general cardiovascular indication. [3, 9]

The nearly 35-year follow-up of the separate Linxian Dysplasia trial found no overall mortality benefit, HR 0.96, 95% CI 0.89–1.03. Among older men, however, heart disease mortality was lower, HR 0.64, 95% CI 0.47–0.87; the cerebrovascular estimate was HR 0.74, 95% CI 0.56–1.00. These are favorable subgroup findings from a trial population with esophageal dysplasia and a high dose formulation. They are not equivalent to an overall reduction in incident myocardial infarction in the general population. [10]

A COSMOS analysis of 8,905 participants without baseline hypertension found no overall prevention of incident hypertension. The lower Mediterranean diet score subgroup had a favorable estimate, HR 0.81, 95% CI 0.70–0.95, whereas the higher score subgroup had HR 1.14, 95% CI 1.01–1.28; P for interaction=0.001. This is an informative exploratory interaction, not proof that poor diet is a necessary condition for every multivitamin benefit. [11]

For a patient whose principal goal is avoiding a heart attack or stroke, multivitamins currently offer an uncertain preventive contribution. They should not be prescribed with the same promised vascular benefit as interventions

supported by positive cardiovascular outcome trials. Cancer or cognitive considerations may still justify a separate discussion.

Cognition, Memory and Dementia

The COSMOS cognitive program provides the strongest contemporary broad spectrum evidence for cognitive benefit. A within trial meta-analysis of three nonoverlapping substudies, totaling 5,203 participants, found better global cognition, mean difference 0.07 standard deviations (SD), 95% CI 0.03–0.11, and episodic memory, 0.06 SD, 95% CI 0.03–0.10. Both remained significant after Bonferroni correction. The consistency across different assessment approaches strengthens this result, although the substudies share a parent trial and intervention. [12]

These are demonstrated improvements in cognitive test performance, not merely a hypothetical nutritional mechanism. The estimate corresponding to roughly two years of cognitive aging offers a useful interpretation of the test difference. It is derived from statistical comparisons between age and performance; it does not mean that participants literally became two years younger or gained two dementia free years. [12]

PHS II found no cognitive benefit among 5,947 men aged at least 65 years. Cognitive testing began, on average, 2.5 years after randomization, limiting its ability to assess an early change from a pretreatment cognitive baseline. That difference is relevant when comparing trials, but does not prove why their results differed. [13]

Incident dementia is a separate clinical endpoint. A COSMOS-Mind analysis recorded 110 cases of mild cognitive impairment and 14 cases of probable dementia over three years and did not establish a reduction in either incidence. The limited number of dementia events leaves substantial uncertainty. The evidence supports discussing preservation of cognitive performance in older adults; it does not yet support telling patients that a daily multivitamin prevents Alzheimer disease. [14]

The practical implication is that an older adult like COSMOS participants can consider a daily trial comparable multivitamin for cognitive health even without a diagnosed deficiency. Expectations should concern memory and composite test performance over years. Whether the observed differences translate into preserved independence, fewer dementia diagnoses or less caregiving remains an important research question.

Biological Aging and Survival

In a prespecified COSMOS ancillary study, 958 participants had five DNA methylation aging measures assessed over two years. Multivitamin assignment slowed progression of PCGrimAge by 0.113 year per year, 95% CI 0.020–0.205, and PCPhenoAge by 0.214 year per year, 95% CI 0.019–0.410, relative to placebo. The corresponding treatment differences were negative because slower clock progression was favorable. Other clocks did not show a consistent benefit. [15]

This provides positive randomized evidence of modification of two biological aging markers. These markers are different from diagnosed disease, disability and survival, however. The study does not establish that taking a multivitamin extends life, nor does it justify serial commercial epigenetic testing to monitor an individual patient's response. [15]

Broad spectrum multivitamins have not consistently reduced all cause mortality in PHS II or COSMOS. A pooled observational analysis of 390,124 adults likewise did not find a survival advantage; its nonrandomized design cannot establish a harmful causal effect from an observed association. Positive mortality findings from SU.VI.MAX men and the Linxian antioxidant trial remain relevant, but are specific to their interventions, populations and observation periods. [2, 3, 4, 6, 8, 16]

Table 1A summarizes favorable findings on disease prevention and biological aging, linking each outcome to the population studied, treatment duration, and daily supplement composition.

General Health, Fatigue, Stress and Functional Performance

"General health" should be translated into measurable outcomes. In a 33-day randomized trial of 215 healthy men, a B vitamin complex with vitamin C, calcium, magnesium and zinc improved perceived stress, general psychological health, vigor, serial subtraction performance and mental tiredness on selected measures. In a nine week trial of 216 women, a broad-spectrum formulation improved selected aspects of performance during demanding multitasking and reduced task related fatigue. These findings support an effect under specific cognitive demands rather than an unqualified claim of enhanced intelligence or treatment of every cause of fatigue. [17, 18]

A 28-day trial randomized 91 physically active young adults, with 82 in the per protocol analysis, to a multivitamin with coenzyme Q10 or placebo. The product altered energy expenditure and substrate utilization, and reduced selected tiredness and stress ratings, with effects differing by sex. Greater energy expenditure is a physiological response, not automatically greater athletic performance or clinically meaningful weight loss. The nonvitamin component also belongs in the description of the intervention. [19]

In 240 young men undergoing demanding military training, a randomized crossover study reported improved psychological, neuroendocrine and immune recovery. The short treatment periods and training context limit extrapolation to long term disease prevention. Small athlete studies involving a multivitamin together with adaptogens also reported favorable training or immune findings, but cannot identify an isolated vitamin effect. [20, 21]

Daily functioning may improve in ways not captured by disease incidence. In a 12-week randomized study of adults aged 70 or older, 228 participants contributed follow-up data. Women reported greater friendliness; men reported lower prolonged and overall stress reactivity and less emotional loneliness. The primary wellbeing outcome did not improve. The female and male formulations differed, and the male product contained Siberian ginseng, so these sex specific results should not be attributed to identical vitamin exposure. [22] Table 1B presents trials reporting favorable symptom and functional outcomes, detailing the formulations and doses evaluated for stress, fatigue, task performance, mood, and illness duration.

Two placebo controlled studies of multivitamin and mineral combinations with Panax ginseng reported favorable quality of life outcomes: Gerovital over eight weeks and Natus Gerin over four weeks. Their interpretation concerns the complete combination. The Gerovital report prints a questionable B12 unit and reports mineral salts rather than elemental amounts,

which limits direct dose replication; complete Natus Gerin trial doses were unavailable in the accessible record. [23, 24]
The CENTRIC observational study of 614 users reported improvements in perceived cognition and energy. It contributes information about user experience but lacks a randomized comparison. A master's dissertation with 136 completers reported improvement in anxiety after 30 days, with several other psychological domains unchanged. These findings help identify outcomes for further testing; they do not provide the same causal certainty as placebo controlled clinical endpoints. [25, 26] Table 1C brings together additional controlled studies and observational reports with favorable functional or patient-reported outcomes, specifying supplement composition where available and identifying limitations in dose verification and causal interpretation.
For persistent fatigue, a practical approach is to define the symptom, assess sleep, mood, medications and relevant medical causes, and then discuss supplementation if appropriate. A time limited trial with reassessment of the same symptom or functional goal is more informative than indefinite escalation of doses. Symptom improvement and chronic disease prevention require different follow-up horizons.

Infection Burden, Eye Health and Other Outcomes

A 12-week randomized trial in 42 adults aged 55–75 years found improved vitamin C and zinc status and fewer days of self-reported illness with a vitamin and mineral combination; measured immune function endpoints did not consistently improve. The favorable illness finding is clinically interesting, but the trial was small. The larger MAVIS trial of 910 older adults did not demonstrate a reduction in infection related morbidity or improved quality of life. [27, 28]
A 2025 community study of 3,415 adults found fewer retrospectively reported upper respiratory infections among regular multivitamin users. After matching the propensity score, period prevalence was 31.7% versus 44.8%, OR 0.572. This is a favorable observational association. Matching reduces measured differences but cannot eliminate recall bias, unmeasured confounding or healthy user behavior. [29]
For eye health, PHS II demonstrated fewer cataracts, HR 0.91, 95% CI 0.83–0.99, while age related macular degeneration was not significantly prevented. This broadens the positive clinical evidence beyond cancer and memory. It does not mean that the PHS II formula is interchangeable with formulations tested for progression of established macular degeneration. [30]
Biomarker studies show that supplementation can raise nutrient concentrations and modify antioxidant or DNA damage responses. A 8-week study of 151 adults and a smaller trial of a plant-based multivitamin with phytonutrients provide examples. Such effects strengthen biological plausibility without independently demonstrating prevention of cancer, vascular events or dementia. [31, 32]

Clinical Application and Product Selection

Documented dietary inadequacy or low blood vitamin concentrations are not prerequisites imposed by PHS II or COSMOS. PHS II collected dietary information, and a later cardiovascular analysis did not identify consistent modification by baseline dietary status. COSMOS-Clinic examined diet quality without a significant interaction for global cognition across the selected subgroups. The trials therefore support discussing supplementation beyond treatment of recognized deficiency. They do not prove that every participant was sufficient in every nutrient, or that effects are identical at all ages. [12, 33]
The most defensible preventive discussion concerns older adults resembling COSMOS participants and men aged at least 50 years resembling those in PHS II. For a person focused on memory, a daily broad-spectrum formulation comparable to the COSMOS intervention is an option supported by positive cognitive outcomes. For a man focused on cancer prevention, the PHS II benefit can be discussed quantitatively, together with the unconfirmed total cancer finding in COSMOS. For a younger adult seeking better daily performance, the evidence is primarily from shorter trials of selected symptoms and tasks, often with quite different doses. Dose selection should follow the formulation associated with the intended outcome rather than the assumption that a larger dose must work better. Tables 1A–1C detail the studied formulations, including vitamin and mineral doses and additional active ingredients, wherever these could be verified. Daily totals are distinguished from the amount in an individual capsule. For example, the Shandong regimen used two capsules per day, so its daily total was vitamin C 500 mg, vitamin E 200 IU and selenium 75 µg. A brand name alone is insufficient: the PHS II and COSMOS products differed substantially despite sharing the Centrum Silver name. [5, 13, 34]
An initial clinical review should record existing supplements and fortified products, the intended endpoint and relevant medicines. Routine measurement of every vitamin is not a requirement established by these prevention trials. Targeted testing is appropriate when symptoms, diet, medications or disease suggest a specific deficiency. A standard multivitamin may be inadequate treatment for an established deficiency requiring a therapeutic dose.
Safety assessment should consider total exposure across products. Avoid stacking multiple preparations with the same ingredients. High dose beta-carotene regimens from historical trials should not be copied into routine prevention for smokers or former smokers. Vitamin K intake requires coordination in patients using warfarin. Conditions such as renal disease, iron overload or malabsorption warrant individualized product selection. Formulations with high B vitamin doses or herbal ingredients deserve a separate assessment of long term suitability and interactions; a short positive trial is not evidence of indefinite safety. [1]
For a fatigue or stress goal, reassessment after approximately four to twelve weeks corresponds to the timescale of several symptom trials. For cancer prevention or cognitive preservation, the relevant evidence concerns years, and there is no validated short term blood test that confirms the preventive effect in an individual. Adherence, tolerability, pill burden, patient priorities and cost should determine whether the proposed benefit is worth continuing. Table 2 provides a practical framework for deciding when supplementation may be considered, matching the patient's clinical goal to the available evidence and the expectations to be discussed.

Limitations and Research Priorities

A narrative synthesis cannot estimate the worldwide proportion of positive studies. Retrieval through public websites was incomplete for several regional sources; missing full formulations reduce clinical reproducibility. Small samples, multiple outcomes, per protocol analyses and

manufacturer involvement affect some symptom studies. Positive findings in products containing ginseng or coenzyme Q10 cannot identify which ingredient produced the effect.

Important next steps are independent replication of COSMOS cognitive findings, adequately powered dementia and disability endpoints, evaluation in more diverse populations, direct comparisons of formulations and longer observation of epigenetic changes alongside clinical outcomes. Trials should publish complete daily compositions and prespecified subgroup analyses. Evidence that does not require deficiency at enrollment should remain available to inform prevention in comparable community populations.

Conclusion

Multivitamin and mineral supplementation have demonstrated benefits for specific outcomes: total cancer and cataract in PHS II, cognitive performance in COSMOS, two epigenetic aging measures, and selected fatigue, stress and illness outcomes in smaller trials. Targeted antioxidant combinations have also reduced gastric cancer outcomes in high-risk populations. These findings justify an individualized preventive discussion even without documented deficiency. The practical answer is that supplementation can be reasonable for a defined goal in a person similar to those studied, using a comparable formulation and realistic expectations. Evidence does not currently establish consistent broad-spectrum prevention of major cardiovascular events, incident dementia or all-cause mortality, or a universal requirement for every adult to take a multivitamin.

Table 1A: Favorable prevention and aging findings

Study and sources	Population and regimen	Ingredients and total daily doses	Favorable finding	Clinical interpretation
PHS II [2, 9, 30]	RCT; 14,641 men ≥50 years; median 11.2 years. One tablet/day.	Centrum Silver (original trial formula). Vitamins: A 5,000 IU (50% beta-carotene); C 60 mg; D 400 IU (10 µg); E 45 IU; K 10 µg; B1 1.5 mg; B2 1.7 mg; niacin 20 mg; B6 3 mg; folic acid 400 µg; B12 25 µg; biotin 30 µg; pantothenic acid 10 mg. Minerals: calcium 200 mg; iron 4 mg; phosphorus 48 mg; iodine 150 µg; magnesium 100 mg; zinc 15 mg; selenium 20 µg; copper 2 mg; manganese 3.5 mg; chromium 130 µg; molybdenum 160 µg; chloride 72.6 mg; potassium 80 mg; boron 150 µg; nickel 5 µg; vanadium 10 µg; silicon 2 mg. Composition: trial appendix, reproduced in [35]; formulation history in [13].	Total cancer HR 0.92 (0.86–0.998). Cataract HR 0.91 (0.83–0.99). Fatal MI HR 0.61 (0.38–0.995), secondary.	Primary cancer benefit. Cataract benefit. Major CVD and overall cognition were not improved.
SU.VI.MAX [4]	RCT; 13,017 adults; men 45–60, women 35–60 years; median 7.5 years. One capsule/day.	Vitamin C 120 mg; vitamin E 30 mg; beta-carotene 6 mg; selenium 100 µg; zinc 20 mg.	Men: cancer RR 0.69 (0.53–0.91); mortality RR 0.63 (0.42–0.93).	Sex subgroup. Overall cancer and mortality nonsignificant. Cancer interaction significant; mortality interaction nonsignificant.
Shandong [5]	Factorial RCT; 3,365 adults from high gastric cancer risk region; supplementation 7.3 years; follow-up 22.3 years. Two capsules/day.	Daily total: vitamin C 500 mg; vitamin E 200 IU; selenium 75 µg. Each capsule contained half these amounts. Other factorial interventions were assigned separately.	Gastric cancer incidence OR 0.64 (0.46–0.91); gastric cancer mortality HR 0.48 (0.31–0.75).	Positive clinical endpoints for a three nutrient combination in a high risk population.
Linxian general population [6, 7, 8]	Factorial RCT; 29,584 adults aged 40–69 years; intervention 5.25 years.	Factor D daily: selenium 50 µg; vitamin E (alpha-tocopherol) 30 mg; beta-carotene 15 mg. Other factors were separately randomized, not inherent components of factor D.	During treatment: total mortality RR 0.91 (0.84–0.99); gastric cancer mortality RR 0.79 (0.64–0.99).	Benefits persisted in earlier follow-up; overall mortality benefit absent at 25 years post-trial. Historical regimen, not a general prescription.
Linxian dysplasia [10, 36]	RCT; 3,318 adults with esophageal dysplasia; 6 years treatment; nearly 35 years follow-up.	Daily combined regimen. Vitamins: beta-carotene 15 mg; A 10,000 IU; E 60 IU; C 180 mg; folic acid 800 µg; B1 5 mg; B2 5.2 mg; niacinamide 40 mg; B6 6 mg; B12 18 µg; D 800 IU (20 µg); biotin 90 µg; pantothenic acid 20 mg. Minerals: calcium 324 mg; phosphorus 250 mg; iodine 300 µg; iron 54 mg; magnesium 200 mg; copper 6 mg; manganese 15 mg; potassium 15.4 mg; chloride 14 mg; chromium 30 µg; molybdenum 30 µg; selenium 50 µg; zinc 45 mg.	Older men: heart disease mortality HR 0.64 (0.47–0.87); cerebrovascular mortality HR 0.74 (0.56–1.00).	Subgroup findings. Overall mortality nonsignificant. Several doses exceed routine preventive requirements.

COSMOS cognition and aging [1]2, 15, 3[4]	Parent RCT: men ≥60, women ≥65 years. Cognitive meta-analysis: 5,203 participants, 2–3 years. Aging: 958, 2 years. One tablet/day.	Centrum Silver (COSMOS trial formula). Vitamins: A 2,500 IU (40% beta-carotene); C 60 mg; D 1,000 IU (25 µg); E 50 IU; K 30 µg; B1 1.5 mg; B2 1.7 mg; niacin 20 mg; B6 3 mg; folic acid 400 µg; B12 25 µg; biotin 30 µg; pantothenic acid 10 mg. Minerals: calcium 220 mg; phosphorus 20 mg; iodine 150 µg; magnesium 50 mg; zinc 11 mg; selenium 19 µg; copper 0.5 mg; manganese 2.3 mg; chromium 50 µg; molybdenum 45 µg; chloride 72 mg; potassium 80 mg; nickel 5 µg; vanadium 10 µg; silicon 2 mg. Other: lutein 250 µg; lycopene 300 µg. No iron or boron listed. Composition source: Supplementary Table S1 in [34].	Global cognition +0.07 SD (0.03–0.11); episodic memory +0.06 SD (0.03–0.10). Slower PCGrimAge and PCPhenoAge progression.	Positive cognitive outcomes and two aging biomarkers. No established incident dementia or survival benefit. Different substudy samples share one parent trial.

All doses are daily totals of the active study product; minerals are reported as nutrient amounts. IU are retained where the trial reported IU because vitamin A/E conversions depend on chemical form. SD, standard deviation; CI, confidence interval; RCT, randomized controlled trial; HR, hazard ratio; RR, relative risk; OR, odds ratio; MI, myocardial infarction. Parentheses after effect estimates contain 95% CIs. Factorial cointerventions are not added to the multivitamin dose. This is a catalog of favorable outcomes, including explicitly identified secondary/subgroup findings, not a list of uniformly positive trials.

Table 1B: Symptom and functional outcomes in defined clinical settings

Study	Population and clinical setting	Outcome or problem investigated	Design and treatment duration	Supplement composition and daily doses	Main findings
Kennedy 2010 [17]	Healthy men aged 30–55 years in full-time employment (n=215); laboratory assessment under sustained mental demand.	Perceived stress, psychological health, vigor, cognitive task performance and mental fatigue.	Randomized, double-blind, placebo-controlled trial; 33 days; one effervescent tablet/day.	Berocca trial formula: B1 15 mg; B2 15 mg; B6 10 mg; B12 10 µg; C 500 mg; biotin 150 µg; folic acid 400 µg; nicotinamide 50 mg; pantothenic acid 23 mg; calcium 100 mg; magnesium 100 mg; zinc 10 mg.	Improved selected stress, psychological health, vigor, serial subtraction and mental tiredness measures.
Haskell 2010 [18]	Healthy women aged 25–50 years (n=216); laboratory assessment during extended multitasking.	Cognitive performance and task-related fatigue during prolonged multitasking.	Randomized, double-blind, placebo-controlled trial; 9 weeks; daily supplement.	Supradyn multivitamin/mineral formulation; individual ingredient doses not verified.*	Improved selected multitasking performance and task related fatigue measures.
Dodd 2020 [19]	Healthy, physically active adults aged 18–35 years; 91 randomized and 82 included in the per-protocol analysis; laboratory exercise and cognitive challenges.	Energy expenditure, substrate oxidation, fatigue and stress during exercise and demanding cognitive tasks.	Randomized, double-blind, placebo-controlled trial; 28 days; one tablet/day; acute and repeated-dose assessments.	Supradyn 3RDA + CoQ10: A 800 µg; B1 3.3 mg; B2 4.2 mg; B6 2 mg; B12 3 µg; C 180 mg; D3 5 µg (200 IU); E 12 mg; K1 25 µg; biotin 50 µg; folic acid 200 µg; nicotinamide 48 mg; pantothenic acid 18 mg; calcium 120 mg; copper 1 mg; iodine 150 µg; iron 14 mg; magnesium 80 mg; manganese 2 mg; molybdenum 50 µg; selenium 50 µg; zinc 10 mg; CoQ10 4.5 mg.	Altered energy expenditure and substrate oxidation; lower selected fatigue/stress ratings, differing by sex.
Fantacone 2020 [27]	Healthy older adults aged 55–75 years (n=42); supplementation assessed for immune function and self-reported illness.	Immune function, vitamin and mineral status, and self-reported illness burden.	Randomized, double-blind, placebo-controlled trial; 12 weeks; two tablets once daily.	Redoxon VI daily total: A 700 µg; D 400 IU (10 µg); E 45 mg; B6 6.6 mg; folate 400 µg; B12 9.6 µg; C 1,000 mg; iron 5 mg; copper 0.9 mg; zinc 10 mg; selenium 110 µg.	Improved vitamin C and zinc status and reduced self-reported illness duration.
Docherty 2025 women [22]	Women aged ≥70 years; 124 women in the follow-up sample of a trial of everyday functioning in older adults.	Subjective wellbeing (primary outcome), mood, everyday functioning and social outcomes.	Randomized, double-blind, placebo-controlled trial; 12 weeks; one tablet/day.	Wellwoman 70+. Shared vitamins: beta-carotene 2 mg; D3 800 IU (20 µg); E 12 mg; C 80 mg; B1 14 mg; B2 4 mg; niacin 30 mg NE; B6 10 mg; folic acid 200 µg; B12 100 µg; biotin 50 µg. Shared minerals: zinc 15 mg; copper 1 mg; manganese 0.5 mg; chromium 75 µg; iodine 150 µg; silicon 10 mg. Shared other actives: lutein esters 2 mg; CoQ10 10 mg; alpha-lipoic acid 20 mg; phosphatidylcholine 7 mg; citrus bioflavonoids 10 mg. Female-specific amounts: pantothenic acid 6 mg; iron 10 mg; selenium 120 µg; L-carnitine 10 mg. No preformed vitamin A listed.	Greater friendliness (P=0.045). Primary wellbeing outcome did not differ significantly from placebo.
Docherty 2025 men [22]	Men aged ≥70 years; 104 men in the follow-up sample of the same trial of everyday functioning in older adults.	Subjective wellbeing (primary outcome), stress reactivity, mood and loneliness.	Same randomized trial; 12 weeks; one tablet/day.	Wellman 70+. Vitamins: beta-carotene 2 mg; D3 800 IU (20 µg); E 12 mg; C 80 mg; B1 14 mg; B2 4 mg; niacin 30 mg NE; B6 10 mg; folic acid 200 µg; B12 100 µg; biotin 50 µg.	Lower prolonged stress reactivity (P=0.007), overall reactivity (P=0.019), emotional loneliness

				Shared minerals: zinc 15 mg; copper 1 mg; manganese 0.5 mg; chromium 75 µg; iodine 150 µg; silicon 10 mg. Shared other actives: lutein esters 2 mg; CoQ10 10 mg; alpha-lipoic acid 20 mg; phosphatidylcholine 7 mg; citrus bioflavonoids 10 mg. Male-specific amounts: preformed A 800 µg RE (2,666 IU); pantothenic acid 10 mg; iron 6 mg; selenium 55 µg; L-carnitine 20 mg; Siberian ginseng extract equivalent to 20 mg; pumpkin seed extract equivalent to 100 mg; L-glutathione 10 mg.	(P=0.042). Primary wellbeing outcome did not differ significantly from placebo.

Reference numbers correspond to the manuscript. Daily doses refer to the published trial products. B1, thiamin; B2, riboflavin; B6, pyridoxine; B12, cobalamin; CoQ10, coenzyme Q10; IU, international units; NE, niacin equivalents; RE, retinol equivalents. The female and male Docherty rows belong to one trial. *Individual ingredient doses could not be verified from the accessible primary report. The favorable findings refer to the complete products, including additional active ingredients.

Table 1C: Additional functional and observational outcomes in defined populations

Study	Population and clinical setting	Outcome or problem investigated	Design and treatment duration	Supplement composition and daily doses	Main findings
Li 2013 [20]	Young men exposed to intense military training and physical overtraining (n=240).	Psychological, neuroendocrine and immune recovery after intense training.	Randomized, double-blind, placebo-controlled crossover trial; one-week treatment periods.	Multivitamin/mineral formulation; individual ingredient doses not verified.*	Favorable psychological, neuroendocrine and immune recovery.
Gerovital 2010 [23]	Adults aged 30–60 years with physical or mental stress and/or fatigue symptoms; 126 enrolled and 114 completed.	Quality of life, mood, and physical and sexual activity in people with stress or fatigue symptoms.	Randomized, double-blind, placebo-controlled trial; 8 weeks; two capsules/day.	Daily total (2 capsules), calculated from published per-capsule amounts: ginseng extract 200 mg; A 4,000 IU; B1 2.6 mg; B2 2.6 mg; B6 1 mg; C 130 mg; D3 800 IU; E 20 mg; biotin 20 µg; nicotinamide 26 mg; D-panthenol 10 mg; rutin 20 mg. B12: unit unresolved in the original report.† Mineral salt totals†: sodium fluoride 0.2 mg; calcium phosphate 60 mg; iron sulphate 20 mg; potassium iodide 0.3 mg; magnesium sulphate 12 mg; manganese sulphate 3 mg; potassium sulphate 10 mg.	Favorable quality of life measures.
Natus Gerin 2011 [24]	Adults experiencing physical or mental stress; 176 enrolled and 159 completed.	Quality of life, mood and physical activity in people with physical or mental stress.	Randomized, placebo-controlled trial; 4 weeks; two capsules/day.	Multivitamin/mineral formulation with Panax ginseng; individual ingredient doses not verified.*	Favorable quality of life measures.
Athlete study 2021 [21]	Highly trained student athletes; four groups of 10 participants.	Immune status and physical performance during athletic training.	Controlled four-group study; 28 days; vitamin C active control.	Vitrum alone or with adaptogens; individual trial doses not verified.*	Favorable immune/training findings in combination groups.
Gorden 2022 [26]	Young adults recruited across body mass index categories; 136 completers.	Anxiety, depression, self-esteem, dysregulation and perceived stress.	Randomized, placebo-controlled study reported in a master's thesis; 30 days.	Multivitamin/mineral formulation; individual ingredient doses not verified.*	Greater reduction in anxiety scores than placebo (P=0.003); depression, dysregulation, self-esteem and perceived stress did not significantly improve.
CENTRIC 2025 [25]	Adult multivitamin users in clinical practice (n=614): 203 Centrum Men users, 210 Centrum Women users and 201 Adults 50+	Perceived cognitive function, energy, stress and other patient-reported health outcomes.	Observational study using pre- and post-use patient-reported data; no randomized comparator.	Reported formula amounts, ordered Men/Women/Adults 50+ (daily exposure not standardized): A 800/800/800 µg; C 80/65/65 mg; D2 600/600/600 IU; E 5/9/9 mg; biotin 25/25/25 µg; folate 200/220/220 µg; B12 2.2/2.2/2.2 µg; B1 1.2/1/1 mg; B2 1.2/1/1.1 mg; B3 15/14/11 mg; B5 5/5/5 mg; B6 1.3/1.3/1.3 mg; K 55/55/55 µg; calcium 250/325/250 mg;	Improved perceived cognition and energy.

	users; regular use for ≥3 months.			iron 3.7/4.4/4.4 mg; zinc 11/11/11 mg; iodine 140/140/140 µg; magnesium 66/66/66 mg; manganese 1.2/1.8/2.3 mg; copper 0.45/0.45/0.9 mg; selenium 40/40/40 µg; chromium 17.5/30/30 µg; molybdenum 45/45/45 µg. Other actives: grape seed extract 100 mg (Men), sodium hyaluronate 5 mg (Women), Boswellia extract 250 mg (50+).	
Respiratory study 2025 [29]	Community-based adults in China (n=3,415); regular multivitamin users for ≥3 months compared with nonusers.	Self-reported upper respiratory infection prevalence and associated symptoms over the preceding three months.	Retrospective observational comparison with propensity score matching; no assigned intervention.	Centrum multivitamin/mineral product; individual formulation and daily dose not verified.*	After matching, self-reported infection prevalence was 31.7% in users versus 44.8% in nonusers (OR 0.572); favorable association.

Reference numbers correspond to the manuscript. *Individual original doses were not verified and were not replaced by current product labels. †Gerovital mineral amounts are masses of salts, not elemental nutrients; the B12 unit printed in the original report requires clarification and is not a verified prescribing dose. CENTRIC amounts are reported product compositions, ordered Men/Women/Adults 50+; individual daily exposure was not standardized. Observational associations do not establish causation. OR, odds ratio.

Table 4: Practical decisions by clinical goal

Patient goal or situation	Clinical approach	What to communicate
Cognitive health in an older adult	Reasonable to discuss a daily formulation comparable to COSMOS, even without documented deficiency.	Explain improved memory/global test performance; prevention of dementia or dependence remains unproved.
Cancer prevention in a man aged ≥50 years	Discuss PHS II: 8% relative reduction; rate difference 1.3 cases/1,000 person years.	COSMOS did not confirm total cancer prevention. A patient's risk and priorities determine relevance.
High gastric cancer risk	Recognize Shandong and Linxian antioxidant benefits in their specific settings.	Do not copy historical regimens as routine prescriptions; address H. pylori and other indicated preventive care.
Avoiding myocardial infarction or stroke	Major CVD prevention is not established for broad spectrum multivitamins.	Positive secondary/subgroup findings do not establish a general vascular indication.
Fatigue, stress or demanding tasks	Assess causes; a defined, time limited trial can be discussed where the formulation and goal match a study.	Reassess the same outcome after about 4–12 weeks. Effects may concern selected tasks or symptoms.
General health or longer life	Discuss specific supported outcomes rather than an undefined global benefit.	Epigenetic changes are not proof of longer survival. Routine epigenetic monitoring is unsupported.
Poor intake or confirmed deficiency	Address nutritional needs and use targeted replacement when indicated.	Poor intake or low blood levels are not prerequisites for considering the preventive trials.
Product and dose choice	Compare daily ingredient totals, original trial formula, medicines and other supplements.	No automatic equivalence across brands, revised labels, gummies or high dose products.

Clinical interpretation of the evidence, not a universal recommendation. Deficiency treatment and pregnancy, bariatric or malabsorption protocols require separate assessment.

References

1. National Institutes of Health, Office of Dietary Supplements. Multivitamin/mineral supplements: health professional fact sheet [Internet]. [cited 2026 Nov 1]. Available from: https://ods.od.nih.gov/factsheets/MVMS-HealthProfessional/
2. Gaziano JM, Sesso HD, Christen WG, Bubes V, Smith JP, MacFadyen J, *et al*. Multivitamins in the prevention of cancer in men: the Physicians' Health Study II randomized controlled trial. JAMA. 2012;308(18):1871-80. doi:10.1001/jama.2012.14641.
3. Sesso HD, Rist PM, Aragaki AK, Rautiainen S, Johnson LG, Friedenberg G, *et al*. Multivitamins in the prevention of cancer and cardiovascular disease: the COcoa Supplement and Multivitamin Outcomes Study (COSMOS) randomized clinical trial. Am J Clin Nutr. 2022;115(6):1501-10. doi:10.1093/ajcn/nqac056.
4. Hercberg S, Galan P, Preziosi P, Bertrais S, Mennen L, Malvy D, *et al*. The SU.VI.MAX Study: a randomized, placebo-controlled trial of the health effects of antioxidant vitamins and minerals. Arch Intern Med. 2004;164(21):2335-42. doi:10.1001/archinte.164.21.2335.
5. Li WQ, Zhang JY, Ma JL, Li ZX, Zhang L, Zhang Y, *et al*. Effects of Helicobacter pylori treatment and vitamin and garlic supplementation on gastric cancer incidence and mortality: follow-up of a randomized intervention trial. BMJ. 2019;366:l5016. doi:10.1136/bmj.l5016.
6. Blot WJ, Li JY, Taylor PR, Guo W, Dawsey S, Wang GQ, *et al*. Nutrition intervention trials in Linxian, China: supplementation with specific vitamin/mineral combinations, cancer incidence, and disease-specific mortality in the general population. J Natl Cancer Inst. 1993;85(18):1483-92. doi:10.1093/jnci/85.18.1483.
7. Qiao YL, Dawsey SM, Kamangar F, Fan JH, Abnet CC, Sun XD, *et al*. Total and cancer mortality after supplementation with vitamins and minerals: follow-up of the Linxian General Population Nutrition Intervention Trial. J Natl Cancer Inst. 2009;101(7):507-18. doi:10.1093/jnci/djp037.
8. Wang SM, Taylor PR, Fan JH, Pfeiffer RM, Gail MH, Liang H, *et al*. Effects of nutrition intervention on total and cancer mortality: 25-year post-trial follow-up of the

5.25-year Linxian Nutrition Intervention Trial. J Natl Cancer Inst. 2018;110(11):1229-38. doi:10.1093/jnci/djy043.
9. Sesso HD, Christen WG, Bubes V, Smith JP, MacFadyen J, Schvartz M, *et al*. Multivitamins in the prevention of cardiovascular disease in men: the Physicians' Health Study II randomized controlled trial. JAMA. 2012;308(17):1751-60. doi:10.1001/jama.2012.14805.
10. Fan JH, Wang JB, Yang H, Dawsey SM, Taylor PR, Qiao YL, *et al*. Mortality after multivitamin supplementation: nearly 35-year follow-up of the randomized Linxian Dysplasia Nutrition Intervention Trial. Cancer. 2022;128(15):2939-48. doi:10.1002/cncr.34344.
11. Hamaya R, Li S, Lau J, Rautiainen S, Haring B, Liu S, *et al*. Long-term effect of multivitamin supplementation on incident self-reported hypertension and blood pressure changes in the COSMOS trial. Am J Hypertens. 2026;39(4):538-46. doi:10.1093/ajh/hpaf224.
12. Vyas CM, Manson JE, Sesso HD, Cook NR, Rist PM, Weinberg A, *et al*. Effect of multivitamin-mineral supplementation versus placebo on cognitive function: results from the clinic subcohort of the COcoa Supplement and Multivitamin Outcomes Study (COSMOS) randomized clinical trial and meta-analysis of 3 cognitive studies within COSMOS. Am J Clin Nutr. 2024;119(3):692-701. doi:10.1016/j.ajcnut.2023.12.011.
13. Grodstein F, O'Brien J, Kang JH, Dushkes R, Cook NR, Okereke O, *et al*. Long-term multivitamin supplementation and cognitive function in men: a randomized trial. Ann Intern Med. 2013;159(12):806-14. doi:10.7326/0003-4819-159-12-201312170-00006.
14. Sachs BC, Williams BJ, Gaussoin SA, Baker LD, Manson JE, Espeland MA, *et al*. Impact of multivitamin-mineral and cocoa extract on incidence of mild cognitive impairment and dementia: results from the COcoa Supplement and Multivitamin Outcomes Study for the Mind (COSMOS-Mind). Alzheimers Dement. 2023;19(11):4863-71. doi:10.1002/alz.13078.
15. Li S, Hamaya R, Zhu H, Chen BH, Pereira AC, Ivey KL, *et al*. Effects of daily multivitamin-multimineral and cocoa extract supplementation on epigenetic aging clocks in the COSMOS randomized clinical trial. Nat Med. 2026;32(3):1012-22. doi:10.1038/s41591-026-04239-3.
16. Loftfield E, O'Connell CP, Abnet CC, Graubard BI, Liao LM, Beane Freeman LE, *et al*. Multivitamin use and mortality risk in 3 prospective US cohorts. JAMA Netw Open. 2024;7(6):e2418729. doi:10.1001/jamanetworkopen.2024.18729.
17. Kennedy DO, Veasey R, Watson A, Dodd F, Jones E, Maggini S, *et al*. Effects of high-dose B vitamin complex with vitamin C and minerals on subjective mood and performance in healthy males. Psychopharmacology (Berl). 2010;211(1):55-68. doi:10.1007/s00213-010-1870-3.
18. Haskell CF, Robertson B, Jones E, Forster J, Jones R, Wilde A, *et al*. Effects of a multi-vitamin/mineral supplement on cognitive function and fatigue during extended multi-tasking. Hum Psychopharmacol. 2010;25(6):448-61. doi:10.1002/hup.1144.
19. Dodd FL, Kennedy DO, Stevenson EJ, Veasey RC, Walker K, Reed S, *et al*. Acute and chronic effects of multivitamin/mineral supplementation on objective and subjective energy measures. Nutr Metab (Lond). 2020;17:16. doi:10.1186/s12986-020-00435-1.
20. Li X, Huang WX, Lu JM, Yang G, Ma FL, Lan YT, *et al*. Effects of a multivitamin/multimineral supplement on young males with physical overtraining: a placebo-controlled, randomized, double-blinded cross-over trial. Biomed Environ Sci. 2013;26(7):599-604. doi:10.3967/0895-3988.2013.07.012.
21. Zaitseva IP, Tsygan VN, Kim AE. Effect of Vitrum combined with adaptogens on immune status and physical performance in highly qualified student athletes [descriptive translation of Russian title]. Sports Med Res Pract. 2021;11(1):24-9. doi:10.47529/2223-2524.2021.1.2.
22. Docherty S, Wetherell MA, McInnes L, Haskell-Ramsay CF. Improvements to mood, stress and loneliness following 12-week multivitamin supplementation in older adults: a randomised, placebo-controlled trial. Eur J Clin Nutr. 2025;79(2):126-35. doi:10.1038/s41430-024-01517-6.
23. Perazzo FF, Fonseca FLA, Souza GHB, Maistro EL, Rodrigues M, Carvalho JCT. Double-blind clinical study of a multivitamin and polymineral complex associated with Panax ginseng extract (Gerovital). Open Complement Med J. 2010;2:100-4. Available from: https://benthamopenarchives.com/contents/pdf/TOALTMEDJ/TOALTMEDJ-2-100.pdf
24. Perazzo FF, Souza GHB, Maistro EL, Rodrigues M, Fonseca FLA, Carvalho JCT. Clinical study of a multivitamin and polymineral complex associated with Panax ginseng extract (Natus Gerin). Latin Am J Pharm. 2011;30:1229-33. Available from: https://acervodigital.unesp.br/handle/11449/72610
25. Shivane V, Sharma A, Bhagat T, Narang P, Tan S, Abraham J. CENTRIC observational study: effectiveness of Centrum multivitamin supplementation on cognitive function and energy parameters in the Indian population. Int J Pharm Bio-Med Sci. 2025;5:512-20. doi:10.47191/ijpbms/v5-i9-06.
26. Gorden C. Efficacy of multivitamin-mineral supplementation on measures of anxiety, depression, self-esteem, dysregulation, and perceived stress in young adults [master's thesis]. University of Arkansas; 2022. Available from: https://scholarworks.uark.edu/etd/4502/
27. Fantacone ML, Lowry MB, Uesugi SL, Michels AJ, Choi J, Leonard SW, *et al*. The effect of a multivitamin and mineral supplement on immune function in healthy older adults: a double-blind, randomized, controlled trial. Nutrients. 2020;12(8):2447. doi:10.3390/nu12082447.
28. Avenell A, Campbell MK, Cook JA, Hannaford PC, Kilonzo MM, McNeill G, *et al*. Effect of multivitamin and multimineral supplements on morbidity from infections in older people (MAVIS trial): pragmatic, randomised, double blind, placebo controlled trial. BMJ. 2005;331(7512):324-9. doi:10.1136/bmj.331.7512.324.
29. Wang F, Kang J, Wei W, Bao Y, Chen A, Deng F, *et al*. Multivitamin-mineral supplementation prevents acute upper respiratory tract infections. Asia Pac J Clin Nutr.

2025;34(4):596-609. doi:10.6133/apjcn.202508_34(4).0011.
30. Christen WG, Glynn RJ, Manson JE, MacFadyen J, Bubes V, Schvartz M, *et al*. Effects of multivitamin supplement on cataract and age-related macular degeneration in a randomized trial of male physicians. Ophthalmology. 2014;121(2):525-34. doi:10.1016/j.ophtha.2013.09.038.
31. Li M, Li Y, Wu Z, Huang W, Jiang Z. Effects of multi-nutrients supplementation on the nutritional status and antioxidant capability of healthy adults [article in Chinese]. Wei Sheng Yan Jiu. 2012;41(1):60-4.
32. Yeo E, Hong J, Kang S, Lee W, Kwon O, Park E. A plant-based multivitamin, multimineral, and phytonutrient supplementation enhances the DNA repair response to metabolic challenges. J Nutr Health. 2022;55:450-61. doi:10.4163/jnh.2022.55.4.450.
33. Rautiainen S, Gaziano JM, Christen WG, Bubes V, Kotler G, Glynn RJ, *et al*. Effect of baseline nutritional status on long-term multivitamin use and cardiovascular disease risk: a secondary analysis of the Physicians' Health Study II randomized clinical trial. JAMA Cardiol. 2017;2(6):617-25. doi:10.1001/jamacardio.2017.0176.
34. Crandall CJ, Chou S, Kim E, Ratnarajah D, Cook NR, Clar A, *et al*. Effects of cocoa extract supplementation and multivitamin/multimineral supplements on self-reported fractures in the Cocoa Supplement and Multivitamins Outcomes Study randomized clinical trial. J Bone Miner Res. 2025;40(5):591-602. doi:10.1093/jbmr/zjaf030.
35. Rutjes AW, Denton DA, Di Nisio M, Chong LY, Abraham RP, Al-Assaf AS, *et al*. Vitamin and mineral supplementation for maintaining cognitive function in cognitively healthy people in mid and late life. Cochrane Database Syst Rev. 2018;12(12):CD011906. doi:10.1002/14651858.CD011906.pub2.
36. Wang JB, Abnet CC, Fan JH, Qiao YL, Taylor PR. The randomized Linxian Dysplasia Nutrition Intervention Trial after 26 years of follow-up: no effect of multivitamin supplementation on mortality. JAMA Intern Med. 2013;173(13):1259-61. doi:10.1001/jamainternmed.2013.6066.

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