

“Elder Car” Nutrition Tips for older adult

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Introduction

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Introduction

- Today, the issue of the well-being of the elderly has become a severe policy-making challenge
- The complexity, multidimensionality, and multilevel nature of the concept of well-being have led to numerous indexations in the objective and subjective dimensions and at the micro and macro levels. In recent years, the **Global Age Watch Index** has been designed and introduced to describe and measure the well-being of the elderly.

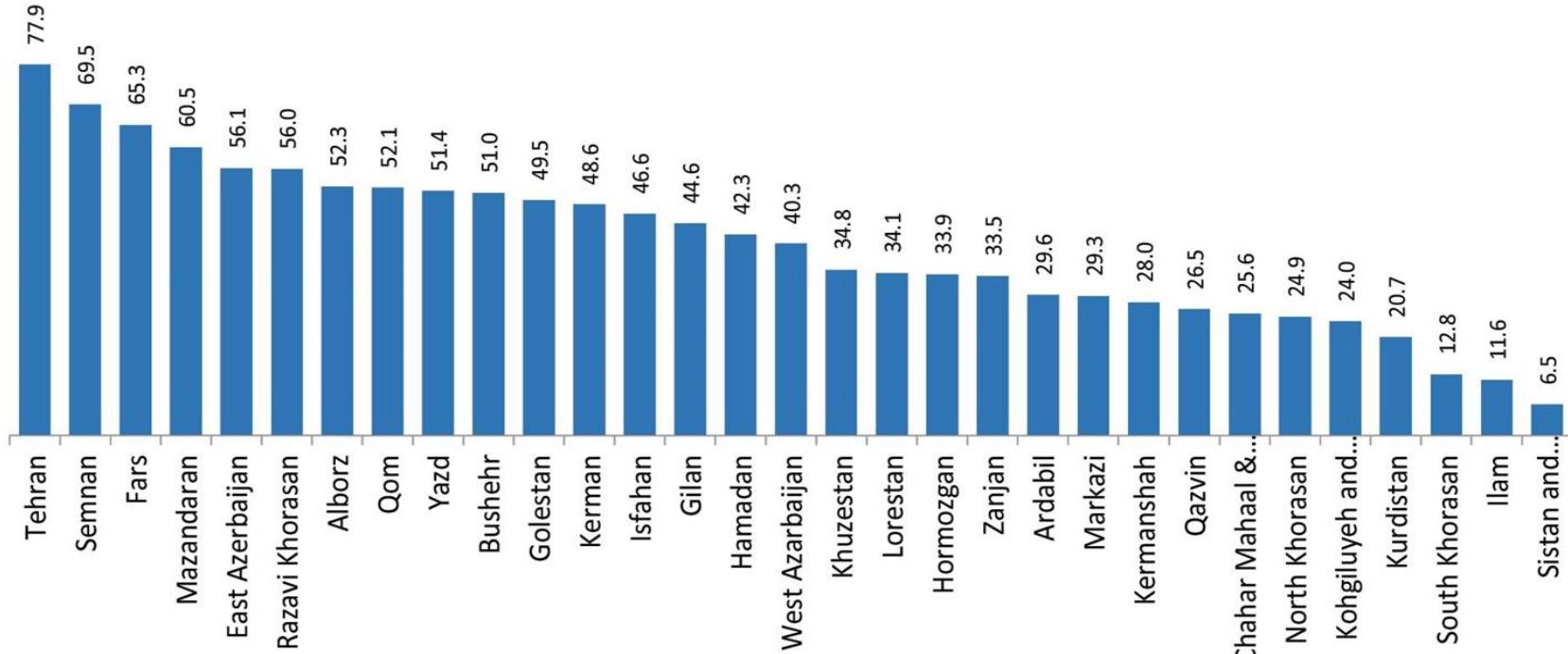


Figure 1. Ranking of Iranian provinces based on the score of the AgeWatch Index, 2016

The Global Age Watch

- The Global AgeWatch Index is a composite index that measures **quality of life** of older people, and ranks countries based on four domains-income security, health status, enabling environment and capability.
- Old Age Watch is regarded as one of the indexes used for understanding, monitoring, and policymaking in the field of elderly well-being.

Nutritional needs

Changes that affect on nutrients need

TABLE 56.1

POTENTIAL PHYSIOLOGIC AND METABOLIC DETERMINANTS OF NUTRIENT NEEDS AND INTAKES IN
OLDER ADULTS

	FACTOR OR CONDITION	EFFECT ON DIETARY REQUIREMENTS
1 Physiologic changes	Decreased total energy expenditure and reduced physical activity	Decreased energy requirement; increased importance of nutrient dense diet
	Decreased muscle mass and strength	Possible increased protein requirement; functional impairments could limit food access.
	Decreased immune competence	Possible increased requirement for iron, zinc, other nutrients
	Detrimental oral changes	Decreased amount and/or quality of nutrient intake
	Gastrointestinal: atrophic gastritis	Increased requirements for folate, calcium, vitamin K, vitamin B ₁₂ , and iron
2 Metabolic changes	Menopause	Decreased requirement for iron
	Reduced skin synthesis of previtamin D ₃ ; impaired renal activation of and reduced gut response to 1,25(OH) ₂ D	Increased requirements for vitamin D and calcium
	Increased retention of vitamin A; altered hepatic metabolism	Decreased requirement for vitamin A
	Decreased ability to regulate fluid balance	Fluid needs possibly increased or decreased; fluid monitoring required

2 Nutritional Assessment

- Nutritional screening and assessment should be part of the standard of care for all older adults
- The goal of nutritional screening is to identify individuals who are at increased risk of being **undernourished or malnourished.**

- Serum albumin, the most commonly measured parameter, declines slightly with age (0.8 g/L/decade after age 60 years)
- is influenced by a host of pathologic changes that are frequent in older adults, including chronic inflammation, advanced liver disease, heart failure, and nephrotic syndrome.

- Additionally, albumin is unlikely to be responsive to protein repletion in a timely manner
- The Long- Term Care Minimum Data Set considers a **weight loss of 5% of usual body weight in 30 days or 10% in 180 days** as a trigger for activating clinical assessment protocols

- Unintentional recent weight loss is associated with increased mortality . Even with a stable body weight, older adults may have a marked reduction in fat-free mass or increases in fat mas
- Changes in mental or emotional status may also be associated with an inadequate nutritional state

physical examination can reveal signs of clinical nutritional deficiencies:

1

skin changes

2

**Fatigue and
weakness**

3

**changes in ability
to taste or smell**

4

**gastrointestinal
complaints**

poor appetite, oral problems,
nausea, vomiting, diarrhea,
constipation



Vitamins B12

cobalamin concentration should be **350 pg/mL**



Vitamin D

concentration should be **50 nmol/L or 20 ng/L**



Ferritin

should be **12 to 300 ng/mL in men and 12 to 150 ng/mL in women**



Hemoglobin

should be **14.0 to 17.5 g/dL in men and 12.3 to 15.3 g/dL in women**

Assesing Dietary intake

1- 24- hour recal

2- Dietary Record

3-FFQ

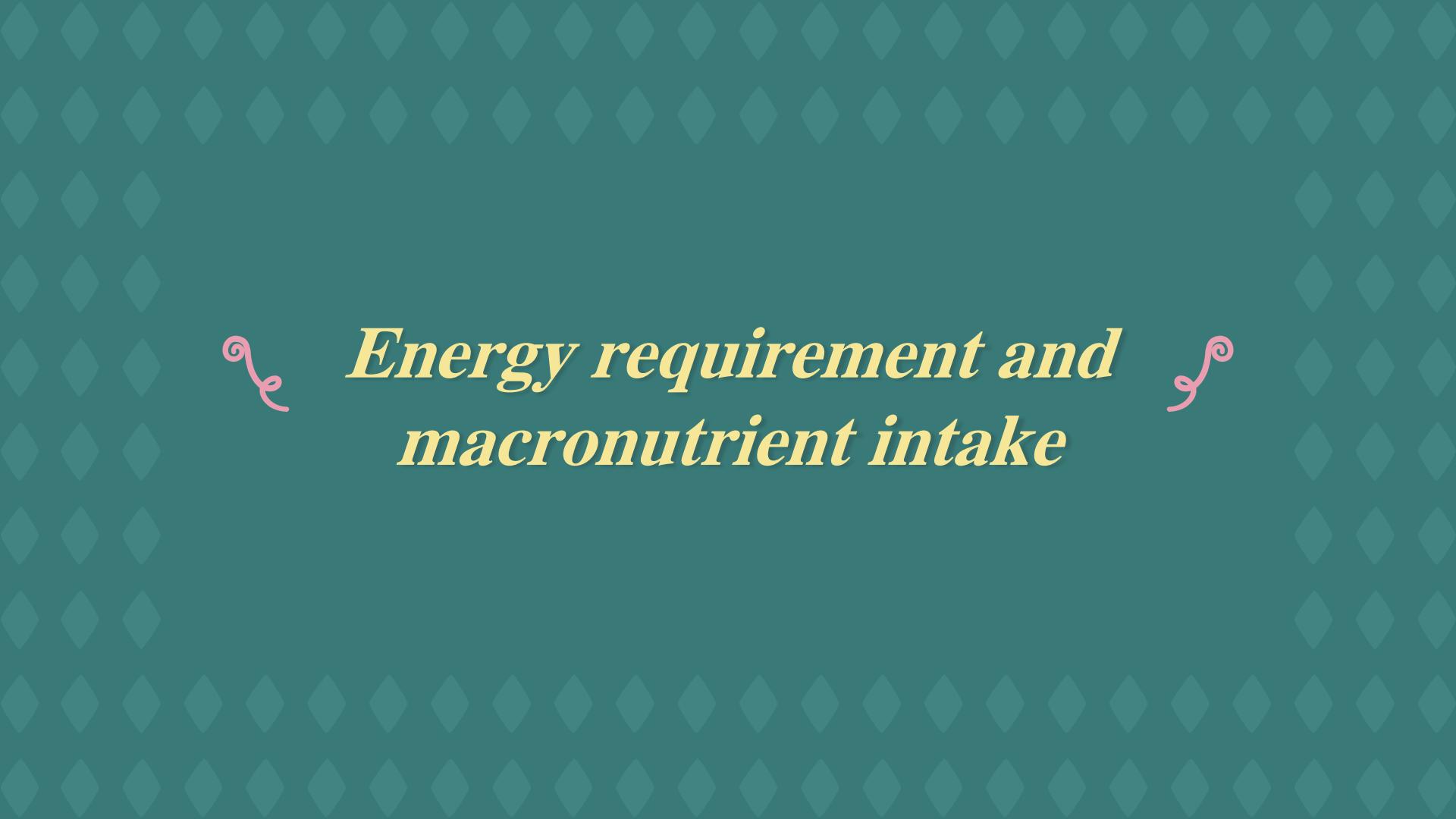
Recommendation

3



TABLE 56.2 RECOMMENDATIONS AND INTAKES OF SELECTED NUTRIENTS FOR OLDER ADULTS (NHANES)^a

	RDA (EAR) OR AI ^a				INTAKES FROM FOOD ^b (UNLESS OTHERWISE INDICATED)			
	MEN 50–70 y	MEN >70 y	WOMEN 50–70 y	WOMEN >70 y	MEN 60–69 y ^b or 51–70 y ^{c,d}	MEN ≥70 y ^b or ≥71 y ^{c,d}	WOMEN 60–69 y ^b or 51–70 y ^{c,d}	WOMEN ≥70 y ^b or ≥71 y ^{c,d}
Energy (kcal) ^b					2,140	1,837	1,597	1,491
Protein (g) ^b	56 (46)	56 (46)	46 (38)	46 (38)	84.5	72.7	61.4	56.9
Dietary fiber (g) ^b	30	30	21	21	17.4	17.0	14.9	14.1
Sodium (mg) ^b	1,300	1,200	1,300	1,200	3,517	3,012	2,674	2,364
Potassium (mg) ^b	4,700	4,700	4,700	4,700	2,891	2,728	2,378	2,189
Calcium (mg) ^c	1,000 (800)	1,200 (1,000)	1,200 (1,000)	1,200 (1,000)	951	871	788	748
Diet + supplements (mg) ^{c,e}					1,092	1,087	1,186	1,139
Vitamin D (μg) ^{c,e}	15 (10)	20 (10)	15 (10)	20 (10)	5.1	5.6	3.9	4.5
Diet + supplements (μg) ^{c,e}					8.8	10.7	10.1	10.0
Magnesium (mg) ^b	420 (350)	420 (350)	320 (265)	320 (265)	310	280	253	233
Iron (mg) ^b	8 (6)	8 (6)	8 (5)	8 (5)	16.8	15.6	12.9	12.6
Zinc (mg) ^b	11 (9.4)	11 (9.4)	8 (6.8)	8 (6.8)	13.0	11.5	9.6	9.0
Folate (μg DFE) ^e	400 (320)	400 (320)	400 (320)	400 (320)	583	558	460	454
Diet + supplements (μg DFE) ^d					938	935	900	797
Vitamin B ₁₂ (μg) ^b	2.4 (2.0)	2.4 (2.0)	2.4 (2.0)	2.4 (2.0)	6.01	5.40	4.31	4.37
"Added" vitamin B ₁₂ (μg) ^b					0.94	1.14	0.87	0.94
Vitamin B ₆ (mg) ^b	1.7 (1.4)	1.7 (1.4)	1.5 (1.3)	1.5 (1.3)	2.06	1.97	1.60	1.54
Vitamin A (μg RAE) ^b	900 (625)	900 (625)	700 (500)	700 (500)	650	706	651	616
Vitamin E (mg) ^b	15 (12)	15 (12)	15 (12)	15 (12)	7.6	7.1	6.5	6.2
Vitamin K (μg) ^b	120	120	90	90	97.7	96.6	104.5	95.0



Energy requirement and macronutrient intake

- Energy requirements as well as intakes **decrease** with advancing age.
- A gradual **reduction** of approximately 7 and 10 kcal/year for women and men, respectively, occurs .
- Protein intakes **decrease** with age. However, the current recommended dietary allowance (RDA) for protein is not changed with age; **it is 0.80**

g/kg/day of high-quality protein.

- Fiber intake is inversely associated with the risk of several age-related diseases
- The adequate intake (AI) for fiber is based on prospective studies of fiber and coronary heart disease (CHD).
- The AI for total fiber is based on energy intake and not on age itself.

- **Aging** is associated with a shift toward **less healthful intestinal microflora**, so there is interest in how **fiber**, other **dietary components**, and **probiotics** influence intestinal health.

- **Appropriate hydration** can be a challenge for older adults, with the most common concerns focused on risks for dehydration
- The potential **negative** effects of excessive water consumption have also been noted, including dilutional hyponatremia (water intoxication) and increased nocturia .

- Consumption of **six to eight glasses** of fluid a day is likely adequate for healthy elderly people **except** during stressful situations that are likely to increase fluid loss (e.g., severely hot weather, heavy exertion).



Vitamin D



Supplementation with oral **vitamin D3 or D2** with or without calcium were associated with **reduction** in fracture risk

Very high single annual doses of **vitamin D (12,500 mg or 500,000 IU)** may decrease fall and fracture risk.



Vitamin B12



- The **increased prevalence** of vitamin B12 deficiency with aging is attributed mainly to **atrophic gastritis**, which occurs in approximately 10% to 30% of older adults and impairs digestion of protein-bound vitamin B12 from animal foods

- Other potential causes of protein- bound vitamin B12 malabsorption include gastric resection and gastric infection with *Helicobacter pylori*

as well as the long-term use of drugs that block gastric acid secretion (histamine H2 receptor antagonists [H2RAs] and proton pump inhibitors [PPIs])

Even after the age of 80 years, risk factors

1

advanced age

2

atrophic gastritis

3

nonuse of dietary
supplements

4

white race

- vitamin B12 status in these individuals is maintained by monthly **injections** or daily oral doses (**1000 to 2000 mg daily**)
- People 51 years old and older should meet the recommendation from **“added” vitamin B12 in fortified foods** or dietary supplements



Folic Acid



- The **EAR and RDA** for folate are **similar** for older and younger adults, except no specific recommendation exists for older adults to consume folic acid

Dietary intake alone is much higher than the EAR and RDA.

- Benefits to older adults may include decreased **risk of stroke** but concerns exist about increased risks of certain health problems such as **impaired cognition**

- Serum homocysteine concentrations are positively associated with several health conditions and are inversely associated with folate, vitamin B12, and vitamin B6 status.
- Homocysteine and these B vitamins in age-associated health conditions such as cardiovascular disease (CVD) , neurologic and psychiatric diseases , alzheimer disease (AD) , and osteoporosis .

Iron

- Aging decreases iron requirements for older women (cessation of menstruation) such that iron recommendations are the same for older men and women; iron intakes generally exceed the EAR and RDA

- Although iron stores (e.g., ferritin) increase with age, evidence is inconclusive for a causal role of high iron status or high iron stores with CVD or cancer, except that liver iron accumulation is a risk factor for hepatocellular carcinoma in hemochromatosis .

- At least 20% of anemia in older adults is attributed to iron deficiency; the most common cause of IDA is blood loss related to a gastrointestinal disorder, and distinguishing IDA from other anemias is necessary



Vitamin A



- Vitamin A intakes from food are generally higher than the EAR but lower than the RDA in older adults
- Although vitamin A intake recommendations do not change with age , advanced age may predispose to vitamin A intoxication

- High vitamin A status as a risk factor for poor bone health remains uncertain

Studies showed that vitamin A status and fractures were associated positively only in persons with lower vitamin D intake were not associated , or had a U-shaped relationship such that both high and low vitamin A status increased the risk of fractures .



Vitamin E



- Although no evidence indicates that either absorption or use changes with age, reported intakes of vitamin E are often less than the EAR, possibly because of efforts to cut intakes of high-fat foods or underreporting of these foods.

- Marginal vitamin E status could compromise the ability of older adults to defend against oxidative damage. However, increasing the intakes of vitamin E (to 400 IU) using supplements is not likely to be beneficial and has been linked to an increase in the risk of hemorrhagic stroke



Vitamin K



- The requirement for vitamin K does increase with aging, and intakes of this vitamin are generally adequate in older adults perhaps because of generous intakes of vegetable sources
- Vitamin K status could be important for bone health in older adults, through its role in posttranslational modification of osteocalcin.
- Additionally, the vitamin has the potential to interact with anticoagulant medications that are commonly used by older adults



Magnesium



- Magnesium recommendations remain the same for all adults after the age of 30 years, and men have higher requirements than women
- Magnesium intakes were lower than the EAR in older adults. With advancing age, there may be decreased magnesium absorption, increased urinary excretion, and concern about high intakes in patients with renal failure



Zinc



- The interaction of aging with zinc requirements is poorly understood; moreover, dependable markers of true zinc status are lacking. Average zinc intakes are higher than the RDA in community-dwelling older adults but evidence indicates that zinc insufficiency could be common in nursing home residents.

- The immunoregulatory role of zinc is particularly important in older adults because immune function declines with age; thus, mild-to-moderate zinc deficiency could impair resistance to infection and response to immunizations and contribute to increasing susceptibility to illness.

4

**Nutrition-related
health concern**

- Participation in regular physical activity declines with age; and this change, along with age-associated decreases in energy requirements, contributes to a gradual accumulation of body fat mass.

Inactivity is associated with elevated risk for

1

chronic diseases

2

metabolic
syndrome

3

premature
mortality

Osteoporosis

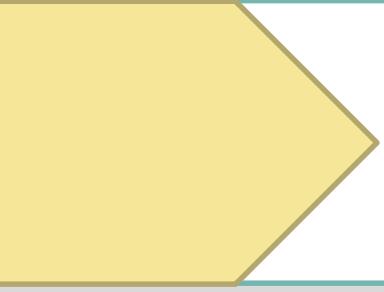
- Osteoporosis is diagnosed based on low bone mineral density or the presence of fragility fractures, such as vertebral or hip fractures.
- The primary diet-related recommendations for the general population are **ai of calcium (1200 mg/day) and vitamin D (20 to 25 mg/day) as well as avoidance of excess alcohol for fall prevention**

- **Vitamin D with calcium reduces** hip fractures in older adults .
- Fall prevention becomes increasing important for prevention of hip fractures in older adults , and vitamin D supplements reduce the rate of falls in nursing home residents

Diabetes



Adiposity and weight gain in midlife contribute to the development of diabetes in later life , and lifestyle improvements in persons at high risk for diabetes reduced the risk of a diabetes diagnosis



Diabetes contributes to the disablement process, so consideration of self-management abilities and frailty is important in diabetes care in older people .



Diabetes was among the stronger health-related predictors of nursing home admission (also high blood pressure, cancer, and stroke)

Chronic hypertension and CHD Account

for more than 70% of heart failure cases

A complex array of neurohormonal, immunologic

Metabolic derangements contribute to the progression of CHF, including increased basal metabolic rate

Changes in protein and fat metabolism, and impaired peripheral blood flow, ultimately contributing to tissue wasting and loss of lean body mass

Chronic hypertension and CHD

Management of CHF involves attention to the intake of macronutrients, water, electrolytes and other nutrients

Stroke

Many patients with stroke are either malnourished at the time of hospital admission or become malnourished during their recovery because of dysphagia or other physical impairments

Based on instrumental swallow evaluation patients may be prescribed dysphagia diets that are texture modified (e.g., soft, chopped, pureed, minced) with or without thick fluids, as well as a diet high in calories and protein.

Patients who have had a stroke and who are acutely dysphagic may be offered enteral feedings within the first few days of admission or within the first 2 to 3 weeks if necessary.

Renal Disease

- Chronic kidney disease (CKD) is common in older adults and carries a significant health and economic burden.
- Although obesity is a risk factor for the development of CKD, obesity can have protective nutritional effects in patients with moderate CKD and in those with stage 5 CKD who are undergoing dialysis

- Implementation of dietary recommendations is complex because intakes of protein, sodium, phosphorus, potassium, and fluids must all be carefully individualized as appropriate for the level of renal function

- Moreover, the prognosis for older adults affected with CKD, and thus the impact of nutrition on ultimate health outcomes, depends not only on renal status but also on functional and cognitive status, body composition, and comorbid conditions and associated therapies, along with other factors

Osteoarthritis

Osteoarthritis is the most common type of arthritis and a frequent reason for the increasing number of joint replacements

By age 85 years, the lifetime risk of symptomatic knee osteoarthritis approaches 50%
overweight and obesity increased the risk of knee arthritis by approximately threefold

Osteoarthritis

Maintaining or achieving optimal body weight and using combinations of diet and exercise are among the more effective preventive and treatment measures

micronutrients such as vitamins C D, E, and K and selenium, as well as glucosamine and chondroitin, may also be important.

5

My pyramid and
My plate



My Pyramid

- The Modified MyPyramid for Older Adults is specifically targeted to relatively healthy people ≥ 70 y who are active and living independently.
- Diets high in fruits, vegetables, whole grains, low- and nonfat dairy products, legumes, fish, and lean meats

FIGURE 2 The major features of the Modified MyPyramid for Older Adults graphic that are different from MyPyramid are ...

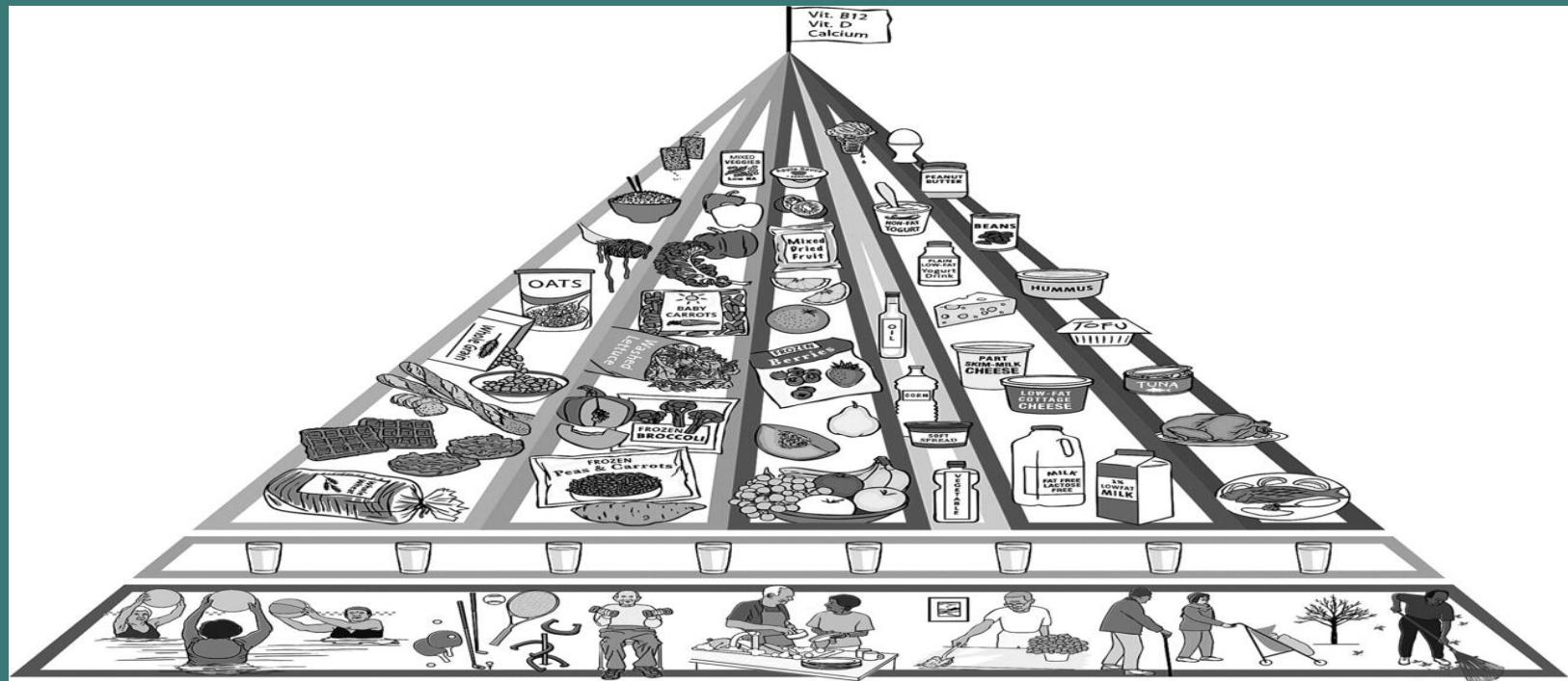


TABLE 1 MyPyramid food pattern recommendations for individuals of different ages, genders, and activity levels¹

Recommended amounts									
Age	Sex	Activity	Energy	Grains	Vegetables	Fruits	Milk	Meat and beans	Oils
<i>y</i>			<i>kcal</i>	<i>oz</i>	<i>cups</i>	<i>cups</i>	<i>cups</i>	<i>oz</i>	<i>tsp</i>
25	F	sedentary	2000	6	2.5	2	3	5.5	6
75	F	active	2000	6	2.5	2	3	5.5	6
20	M	sedentary	2600	9	3.5	2	3	6.5	8
75	M	active	2600	9	3.5	2	3	6.5	8

1 SI unit conversions: 1 kcal = 4.184 kJ, 1 oz = 28 g, 1 cup = 230 mL, 1 tsp = 15 mL.

TABLE 2 Shortfall nutrients for individuals 70 y and older in NHANES 2003–2004¹

Nutrient	Men	Women	Men	Women
	<i>RDA or AI</i>		<i>RDA or AI (% of population below)</i>	
Vitamin D, $\mu\text{g}/\text{d}$	15	15	8.1 (8.8) ³	8.0 (8.8) ³
Calcium, ² mg/d	1200 ²	1200 ²	743 (62) ²	668 (56) ²
Vitamin E, mg/d	15	15	6 (40)	5 (33)
Vitamin K, ² $\mu\text{g}/\text{d}$	120	90	92 (77)	56 (62)
Potassium, mg/d	4700	4700	2441 (52)	2332 (50)
Fiber, ² g/d	30	21	15 (50)	14 (67)

¹ Adapted from (25).

² AI, otherwise RDA.

³ Food plus supplements.

TABLE 3 Potentially overconsumed nutrients for individuals ≥ 70 y in NHANES 2003–2004¹

Nutrient	Recommendation	Men	Women
Folate, $\mu\text{g}/\text{d}$	1000 (UL)	1205	1046
Sodium, mg/d	2300 (AI)	2604	2444

My plate

- 50 percent fruits and vegetables
- 25 percent grains, mostly whole grains
- 25 percent protein-rich foods, such as lean meat, fish, dairy products, nuts and beans.

The guidance also emphasizes selecting healthy fats and fluids, substituting herbs and spices for salt, and choosing nutrient-dense food. And exercise is given a place at the table as well, as an essential part of senior wellness.

MyPlate for Older Adults

Fruits & Vegetables

Whole fruits and vegetables are rich in important nutrients and fiber. Choose fruits and vegetables with deeply colored flesh. Choose canned varieties that are packed in their own juices or low-sodium.

Healthy Oils

Liquid vegetable oils and soft margarines provide important fatty acids and some fat-soluble vitamins.

Herbs & Spices

Use a variety of herbs and spices to enhance flavor of foods and reduce the need to add salt.



Remember to Stay Active!



Fluids

Drink plenty of fluids. Fluids can come from water, tea, coffee, soups, and fruits and vegetables.

Grains

Whole grain and fortified foods are good sources of fiber and B vitamins.

Dairy

Fat-free and low-fat milk, cheeses and yogurts provide protein, calcium and other important nutrients.

Protein

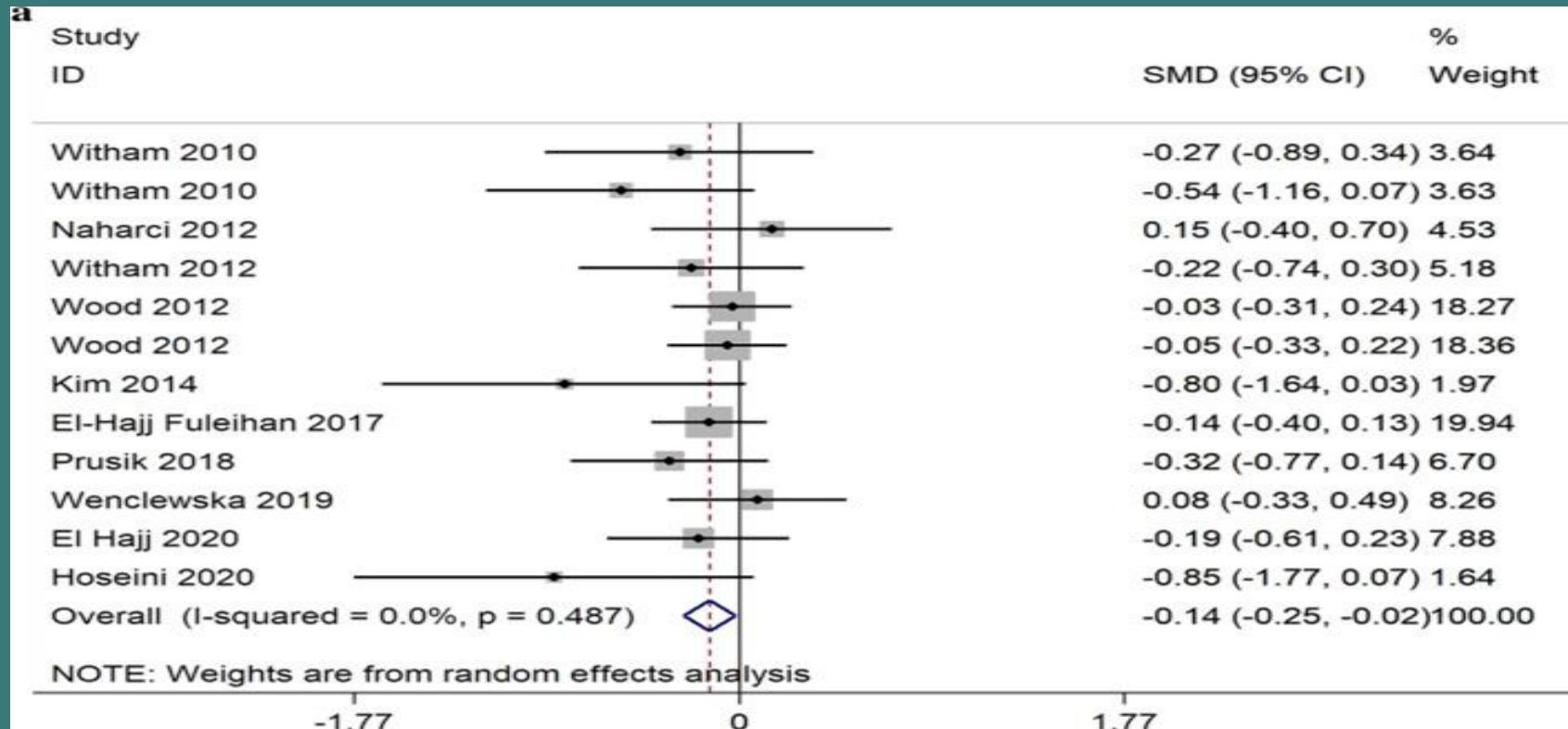
Protein rich foods provide many important nutrients. Choose a variety including nuts, beans, fish, lean meat and poultry.



Reviews new
studies

Effect of vitamin D supplementation on cardiac-metabolic risk factors in elderly: a systematic review and meta-analysis of clinical trials

- Vitamin D supplementation dosage was varied between 400 IU/day to 4000 IU/day. In two studies, a single oral dose of 100,000 IU or 200,000 IU has been prescribed
- The intervention period ranged from 2 months to one year.

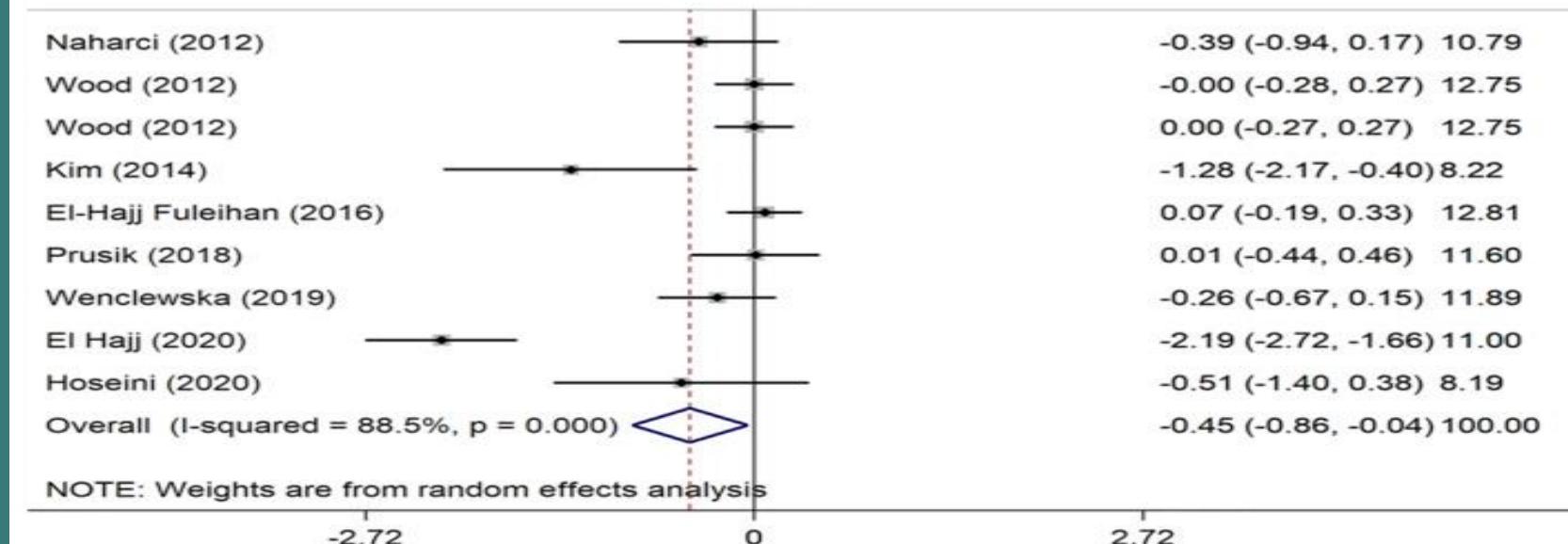
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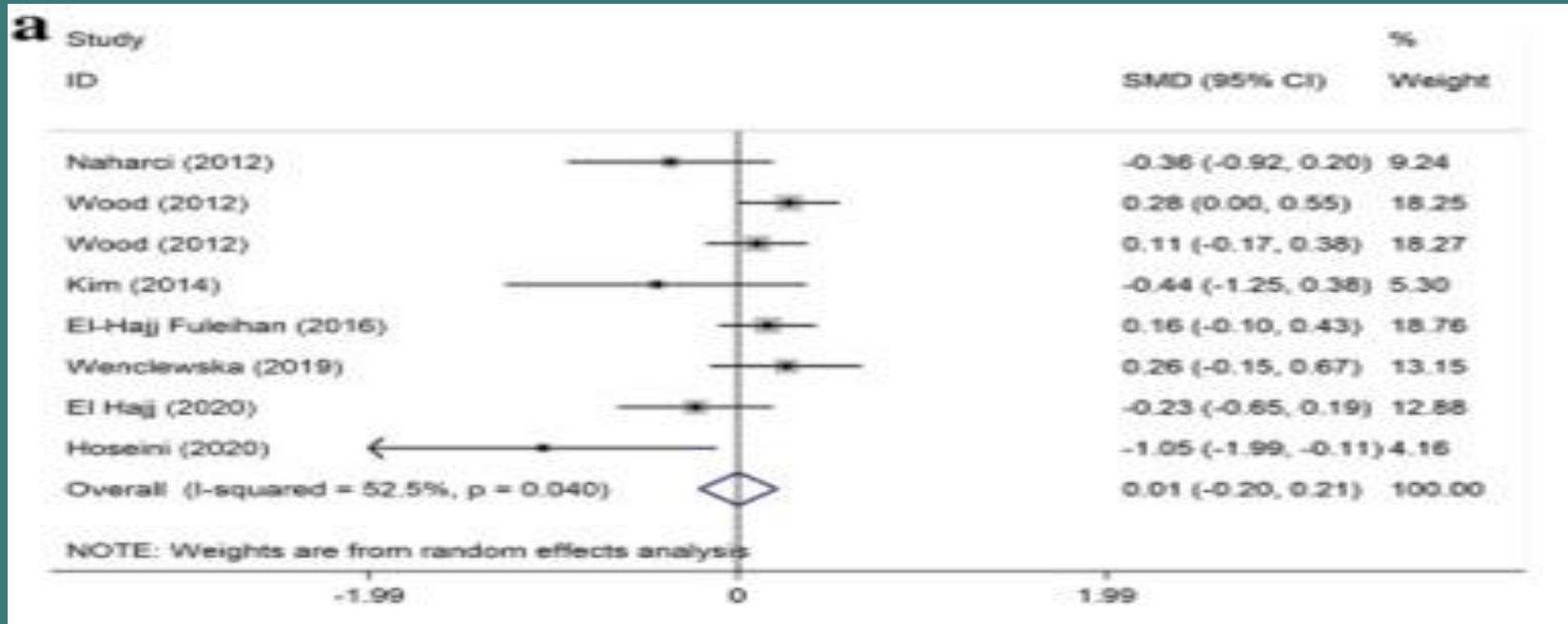
Forest plot of the effect of vitamin D supplementation on total cholesterol

b

Study

ID

SMD (95% CI) %
Weight



Forest plot of the effect of vitamin D supplementation on fasting blood sugar (a), insulin concentration (b), Homeostatic Model Assessment of Insulin Resistance (c), Hemoglobin A1c (d)

b

Study

%

ID:

SMD (95% CI)

VWeight

Nishanci (2012)



-0.44 (-1.00, 0.12) 12.63

Wooed (2012)



0.06 (-0.22, 0.33) 24.61

Wooed (2012)



0.04 (-0.23, 0.32) 24.64

Kim (2014)



-1.29 (-2.17, -0.40) 6.37

El-Hajj Fuleihan (2016)



0.06 (-0.20, 0.32) 25.26

Hosseini (2020)



-0.18 (-1.06, 0.70) 6.49

Overall (I-squared = 54.4%, p = 0.052)



-0.11 (-0.36, 0.14) 100.00

NOTE: Weights are from random effects analysis

-2.17

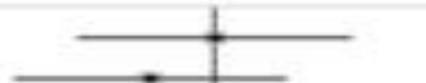
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2.17

Forest plot of the effect of vitamin D supplementation on fasting blood sugar (a), insulin concentration (b), Homeostatic Model Assessment of Insulin Resistance (c), Hemoglobin A1c (d)

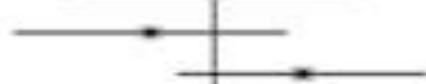
CStudy
ID%
SMD (95% CI) Weight

Witham (2010)



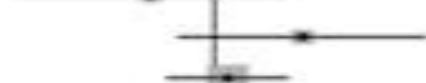
0.00 (-0.61, 0.61) 4.48

Witham (2010)



-0.29 (-0.90, 0.32) 4.55

Naharci (2012)



0.39 (-0.17, 0.95) 5.41

Wood (2012)



0.06 (-0.22, 0.33) 20.08

Wood (2012)



-0.02 (-0.30, 0.25) 20.18

Kim (2014)



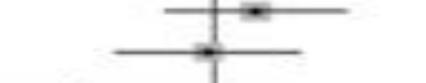
-0.89 (-1.73, -0.04) 2.40

El-Hajj Fuleihan (2016)



0.00 (-0.26, 0.26) 21.72

Wanclewska (2019)



0.18 (-0.23, 0.59) 9.71

El Hajj (2020)



-0.03 (-0.45, 0.39) 9.36

Hoseini (2020)



-0.58 (-1.48, 0.32) 2.13

Overall (I-squared = 6.0%, p = 0.386)



-0.00 (-0.14, 0.13) 100.00

NOTE: Weights are from random effects analysis

-1.73

0

1.73

Forest plot of the effect of vitamin D supplementation on fasting blood sugar (a), insulin concentration (b), Homeostatic Model Assessment of Insulin Resistance (c), Hemoglobin A1c (d)

d

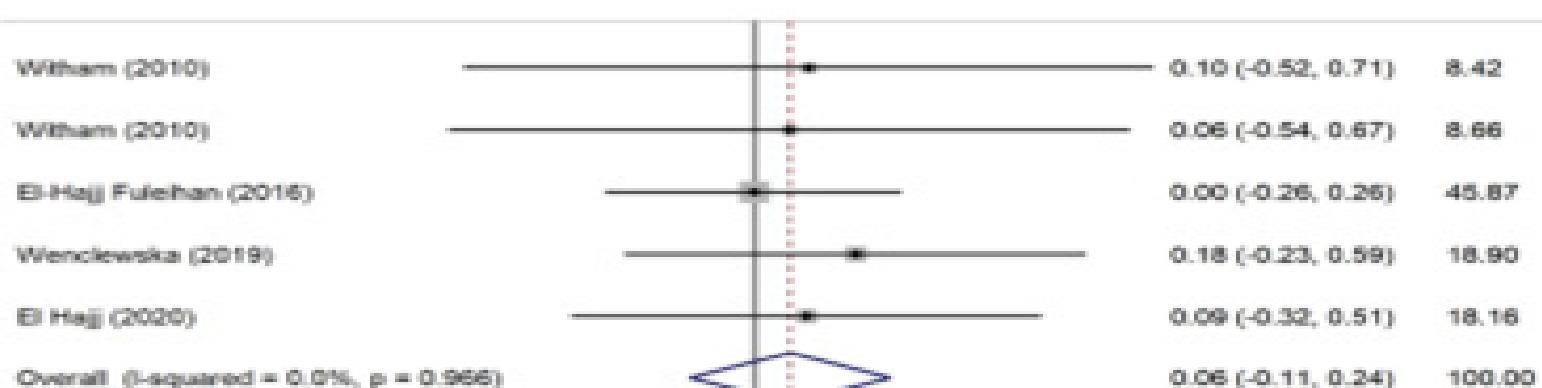
Study

%

ID

SMD (95% CI)

Weight



NOTE: Weights are from random effects analysis

Forest plot of the effect of vitamin D supplementation on fasting blood sugar (a), insulin concentration (b), Homeostatic Model Assessment of Insulin Resistance (c), Hemoglobin A1c (d)

B vitamins and prevention of cognitive decline and incident dementia: a systematic review and meta-analysis

- B vitamin supplementation decreased cognitive decline (3814 participants; MD, 0.15, 95%CI 0.05 to 0.26) compared to placebo; no such outcome was detected for the shorter interventional stratum (806 participants; MD, 0.18, 95%CI -0.25 to 0.61).

- This meta-analysis supports that B vitamins can benefit cognitive function as measured by Mini-Mental State Examination score changes (6155 participants; MD, 0.14, 95%CI 0.04 to 0.23), and this result was also significant in studies where placebo groups developed cognitive decline (4211 participants; MD, 0.16, 95%CI 0.05 to 0.26), suggesting that B vitamins slow cognitive decline.
For the > 12 months interventional period stratum

- In the non-dementia population, B vitamin supplementation slowed cognitive decline (3431 participants; MD, 0.15, 95%CI 0.04 to 0.25) compared to placebo; this outcome was not found for the dementia population (642 participants; MD, 0.20, 95%CI -0.35 to 0.75)

- Lower folate levels (but not B12 or B6 deficiency) and higher Hcy levels were significantly associated with higher risks of dementia (folate: 6654 participants; OR, 1.76, 95%CI 1.24 to 2.50; Hcy: 12665 participants; OR, 2.09, 95%CI 1.60 to 2.74) and cognitive decline (folate: 4336 participants; OR, 1.26, 95%CI 1.02 to 1.55; Hcy: 6149 participants; OR, 1.19, 95%CI 1.05 to 1.34).

- Among the population without dementia aged 50 years and above, the risk of incident dementia was significantly decreased among individuals with higher intake of folate (13529 participants; HR, 0.61, 95%CI 0.47 to 0.78), whereas higher intake of B12 or B6 was not associated with lower dementia risk.

Conclusion

- This meta-analysis suggests that B vitamin supplementation is associated with slowing of cognitive decline, especially in populations who received early intervention and intervention of long duration; the study also indicates that higher intake of dietary folate, but not B12 or B6, is associated with a reduced risk of incident dementia in non-dementia aged population.

Thanks! ☺

Do you have any questions?
azadbakhtleila@gmail.com