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Our Mission: Helping to prepare Iowa's health practitioners to care for our growing population of elders. *E-NEWS* is one of our methods of teaching through technology.

Each month, *E-NEWS* delivers abstracts from current multidisciplinary healthcare journal articles related to a specific geriatric topic. This month's *E-NEWS* focuses on HEALTHY AGING STRATEGIES TO MAXIMIZE MOBILITY, COGNITION, AND FUNCTION.

HEALTHY AGING STRATEGIES TO MAXIMIZE MOBILITY, COGNITION, AND FUNCTION

In this issue of the *E-NEWS*, you will find abstracts for:

- An article that discusses the association between the Mediterranean diet and cognitive health.
 - A study that assesses the proportion of dementia attributable to common modifiable risk factors.
 - A study that investigates the contribution of psychological factors to brain health and resilience and their interaction with cognitive reserve.
 - An article that presents a summary of the evidence on modifiable risk factors for cognitive decline and dementia.
 - A review that explores implementing a public brain health agenda as a universal approach to dementia prevention.
 - An article that reviews the evidence and makes recommendations for dementia prevention, intervention, and care.
 - A study that evaluates whether neuroprotective diets are associated with better cognitive function.
 - A study that examines the results from implementation of the AgeWISE program.
 - A study that seeks to determine whether the FINGER multidomain lifestyle intervention is beneficial regardless of participants' characteristics.
 - A study that analyzes the association between cardiovascular health level and risk of dementia and cognitive decline in older adults.
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- Aridi YS, Walker JL, Wright ORL. The Association between the Mediterranean Dietary Pattern and Cognitive Health: A Systematic Review. *Nutrients*. 2017 Jun 28;9(7). pii: E674.

The ageing population is accompanied by increased rates of cognitive decline and dementia. Not only does cognitive decline have a profound impact on an individual's health and quality of life, but also on that of their caregivers. The Mediterranean diet (MD) has been known to aid in reducing the risk of cardiovascular diseases, cancer and diabetes. It has been recently linked to better cognitive function in the elderly population. The purpose of this review was to compile evidence-based data that examined the effect of adherence to the MD on cognitive function and the risk of developing dementia or Alzheimer's disease. This review followed PRISMA guidelines and was conducted using four databases and resulted in 31 articles of interest. Cross-sectional studies and cohort studies in the non-Mediterranean region showed mixed results. However, cohort studies in the Mediterranean region and randomized controlled trials showed more cohesive outcomes of the beneficial effect of the MD on cognitive function. Although more standardized and in-depth studies are needed to strengthen the existing body of evidence, results from this review indicate that the Mediterranean diet could play a major role in cognitive health and risk of Alzheimer's disease and dementia.



- Ashby-Mitchell K, Burns R, Shaw J, Anstey KJ. Proportion of dementia in Australia explained by common modifiable risk factors. *Alzheimers Res Ther*. 2017 Feb 17;9(1):11.

BACKGROUND: At present, dementia has no known cure. Interventions to delay onset and reduce prevalence of the disease are therefore focused on risk factor reduction. Previous population attributable risk estimates for western countries may have been underestimated as a result of the relatively low rates of midlife obesity and the lower weighting given to that variable in statistical models. METHODS: Levin's Attributable Risk which assumes independence of risk factors was used to calculate the proportion of dementia attributable to seven modifiable risk factors (midlife obesity, physical inactivity, smoking, low educational attainment, diabetes mellitus, midlife hypertension and depression) in Australia. Using a recently published modified formula and survey data from the Australia Diabetes, Obesity and Lifestyle Study, a more realistic population attributable risk estimate which accounts for non-independence of risk factors was calculated. Finally, the effect of a 5-20% reduction in each risk factor per decade on future dementia prevalence was computed. RESULTS: Taking into consideration that risk factors do not operate independently, a more conservative estimate of 48.4% of dementia cases (117,294 of 242,500 cases) was found to be attributable to the seven modifiable lifestyle factors under study. We calculated that if each risk factor was to be reduced by 5%, 10%, 15% and 20% per decade, dementia prevalence would be reduced by between 1.6 and 7.2% in 2020, 3.3-14.9% in 2030, 4.9-22.8% in 2040 and 6.6-30.7% in 2050. CONCLUSION: Our largely theory-based findings suggest a strong case for greater investment in risk factor reduction programs that target modifiable lifestyle factors, particularly increased engagement in physical activity. However, further data on risk factor treatment and dementia risk reduction from population-based studies are needed to investigate whether our estimates of potential dementia prevention are indeed realistic.



- Bartrés-Faz D, Cattaneo G, Solana J, Tormos JM, Pascual-Leone A. Meaning in life: resilience beyond reserve. *Alzheimers Res Ther*. 2018 May 24;10(1):47.

BACKGROUND: The contribution of psychological factors to brain health and resilience remains poorly investigated. Furthermore, their possible interaction with 'classical' cognitive reserve (CR) estimates in predicting perceived mental health and cognitive status has not been specifically addressed. METHODS: We obtained data from 1081 adults responding to questionnaires on the three meaning in life (MiL) dimensions: purpose in life (PiL), sense of coherence (SoC), and engagement with life (EwL). A questionnaire on CR variables was also administered. The outcome measures were self-reported cognitive function and affective status (depression, stress, and anxiety). Multiple linear regression analyses were used to evaluate the association between sociodemographic variables, MiL dimensions, and CR with the two selected outcomes. Mediation analyses, adjusted for age and gender, were applied to determine whether the MiL dimensions mediated the putative effects of CR on self-reported mental and cognitive health. RESULTS: All three MiL components, but not CR estimates, correlated with the self-reported affective status of the participants. Higher CR, PiL, and SoC (but not EwL) scores significantly correlated with higher perceived cognitive function. Notably, the observed association between the CR measures and self-reported cognitive function was mediated by PiL and SoC. CONCLUSIONS: Psychological MiL dimensions mediate the association between classic CR estimates and self-perceived cognitive function. Further studies on CR could consider including

formal measures of such psychological factors to better understand their unique or synergistic contributions, as well as investigate the associated mechanisms maintaining brain function at older ages.



- Baumgart M, Snyder HM, Carrillo MC, Fazio S, Kim H, Johns H. Summary of the evidence on modifiable risk factors for cognitive decline and dementia: A population-based perspective. *Alzheimers Dement.* 2015 Jun;11(6):718-26.

An estimated 47 million people worldwide are living with dementia in 2015, and this number is projected to triple by 2050. In the absence of a disease-modifying treatment or cure, reducing the risk of developing dementia takes on added importance. In 2014, the World Dementia Council (WDC) requested the Alzheimer's Association evaluate and report on the state of the evidence on modifiable risk factors for cognitive decline and dementia. This report is a summary of the Association's evaluation, which was presented at the October 2014 WDC meeting. The Association believes there is sufficient evidence to support the link between several modifiable risk factors and a reduced risk for cognitive decline, and sufficient evidence to suggest that some modifiable risk factors may be associated with reduced risk of dementia. Specifically, the Association believes there is sufficiently strong evidence, from a population-based perspective, to conclude that regular physical activity and management of cardiovascular risk factors (diabetes, obesity, smoking, and hypertension) reduce the risk of cognitive decline and may reduce the risk of dementia. The Association also believes there is sufficiently strong evidence to conclude that a healthy diet and lifelong learning/cognitive training may also reduce the risk of cognitive decline.



- Hussenoeder FS, Riedel-Heller SG. Primary prevention of dementia: from modifiable risk factors to a public brain health agenda? *Soc Psychiatry Psychiatr Epidemiol.* 2018 Sep 25. doi: 10.1007/s00127-018-1598-7. [Epub ahead of print]

INTRODUCTION: With large numbers of people affected, no treatment in sight and continuing demographic change, the prevention of dementia is becoming a central public health issue. METHODS: We conducted a systematic meta-review including systematic reviews and meta-analyses of longitudinal observational studies on modifiable risk and protective factors for dementia published over the last 5 years. RESULTS: Compelling evidence on a number of modifiable risk factors, mostly lifestyle factors, is available from longitudinal observational studies to inform primary preventive efforts. DISCUSSION: Evidence stemming from preventive RCTs is limited. However, multi-domain interventions addressing a variety of risk factors at once seem promising with regard to high-risk individuals (selective preventive approach). However, we argue that it is time to move forward and discuss a public brain health agenda as a universal preventive approach. Based on a risk reduction strategy, the public brain health agenda suggests the following ten key actions: (1) increase physical activity, (2) foster social integration, (3) improve education and foster lifelong learning, (4) provide mentally stimulating workplaces, (5) foster a cognitively active lifestyle, (6) propose a healthy Mediterranean-like diet, (7) reduce alcohol consumption, (8) stop smoking, (9) prevent, diagnose and treat chronic conditions, and (10) reduce anticholinergic medication in the elderly.



- Livingston G, Sommerlad A, Orgeta V, Costafreda SG, Huntley J, Ames D, Ballard C, Banerjee S, Burns A, Cohen-Mansfield J, Cooper C, Fox N, Gitlin LN, Howard R, Kales HC, Larson EB, Ritchie K, Rockwood K, Sampson EL, Samus Q, Schneider LS, Selbæk G, Teri L, Mukadam N. Dementia prevention, intervention, and care. *Lancet.* 2017 Dec 16;390(10113):2673-2734.

Dementia is the greatest global challenge for health and social care in the 21st century: around 50 million people worldwide have dementia and this number is predicted to triple by 2050. The Lancet Commission on dementia aims to review the best available evidence and produce recommendations on how to best manage, or even prevent, the dementia epidemic. Dementia is not an inevitable consequence of ageing and the Commission identifies nine potentially modifiable health and lifestyle factors from different phases of life that, if eliminated, might prevent dementia. Although therapies are currently not available to modify the underlying disease process, the Commission outlines pharmacological and social interventions that are able to help manage the manifestations of dementia.

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- McEvoy CT, Guyer H, Langa KM, Yaffe K. Neuroprotective Diets Are Associated with Better Cognitive Function: The Health and Retirement Study. *J Am Geriatr Soc.* 2017 Aug;65(8):1857-1862.

OBJECTIVES: To evaluate the association between the Mediterranean diet (MedDiet) and the Mediterranean-DASH diet Intervention for Neurodegeneration Delay (MIND diet) and cognition in a nationally representative population of older U.S. adults. DESIGN: Population-based cross-sectional study. SETTING: Health and Retirement Study. PARTICIPANTS: Community-dwelling older adults (N = 5,907; mean age 67.8 ± 10.8). MEASUREMENTS: Adherence to dietary patterns was determined from food frequency questionnaires using criteria determined a priori to generate diet scores for the MedDiet (range 0-55) and MIND diet (range 0-15). Cognitive performance was measured using a composite test score of global cognitive function (range 0-27). Linear regression was used to compare cognitive performance according to tertiles of dietary pattern. Logistic regression was used to examine the association between dietary patterns and clinically significant cognitive impairment. Models were adjusted for age, sex, race, educational attainment, and other health and lifestyle covariates. RESULTS: Participants with mid (odds ratio (OR) = 0.85, 95% confidence interval (CI) = 0.71-1.02, P = .08) and high (OR 0.65, 95% CI = 0.52-0.81, P < .001) MedDiet scores were less likely to have poor cognitive performance than those with low scores in fully adjusted models. Results for the MIND diet were similar. Higher scores in each dietary pattern were independently associated with significantly better cognitive function (P < .001) in a dose-response manner (P trend < .001). CONCLUSION: In a large nationally representative population of older adults, greater adherence to the MedDiet and MIND diet was independently associated with better cognitive function and lower risk of cognitive impairment. Clinical trials are required to elucidate the role of dietary patterns in cognitive aging. ©AGS.

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- O'Connor MK, Kraft ML, Daley R, Sugarman MA, Clark EL, Scoglio AAJ, Shirk SD. The Aging Well through Interaction and Scientific Education (AgeWISE) Program. *Clin Gerontol.* 2018 Oct-Dec;41(5):412-423.

OBJECTIVE: We conducted a randomized controlled trial of the Aging Well through Interaction and Scientific Education (AgeWISE) program, a 12-week manualized cognitive rehabilitation program designed to provide psychoeducation to older adults about the aging brain, lifestyle factors associated with successful brain aging, and strategies to compensate for age related cognitive decline. METHODS: Forty-nine cognitively intact participants ≥ 60 years old were randomly assigned to the AgeWISE program (n = 25) or a no-treatment control group (n = 24). Questionnaire data were collected prior to group assignment and post intervention. Two-factor repeated-measures analyses of covariance (ANCOVAs) were used to compare group outcomes. RESULTS: Upon completion, participants in the AgeWISE program reported increases in memory contentment and their sense of control in improving memory; no significant changes were observed in the control group. Surprisingly, participation in the group was not associated with significant changes in knowledge of memory aging, perception of memory ability, or greater use of strategies. CONCLUSIONS: The AgeWISE program was successfully implemented and increased participants' memory contentment and their sense of control in improving memory in advancing age. CLINICAL IMPLICATIONS: This study supports the use of AgeWISE to improve perspectives on healthy cognitive aging.

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- Rosenberg A, Ngandu T, Rusanen M, Antikainen R, Bäckman L, Havulinna S, Hänninen T, Laatikainen T, Lehtisalo J, Levälahti E, Lindström J, Paajanen T, Peltonen M, Soininen H, Stigsdotter-Neely A, Strandberg T, Tuomilehto J, Solomon A, Kivipelto M. Multidomain lifestyle intervention benefits a large elderly population at risk for cognitive decline and dementia regardless of baseline characteristics: The FINGER trial. *Alzheimers Dement.* 2018 Mar;14(3):263-270.

INTRODUCTION: The 2-year Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) multidomain lifestyle intervention trial (NCT01041989) demonstrated beneficial effects on cognition. We investigated whether sociodemographics, socioeconomic status, baseline cognition, or cardiovascular factors influenced intervention effects on cognition. METHODS: The FINGER recruited 1260 people from the general Finnish population (60-77 years, at risk for dementia). Participants were randomized 1:1 to multidomain intervention (diet, exercise, cognition, and vascular risk management) and regular health advice. Primary outcome was change in cognition (Neuropsychological Test Battery z-score). Prespecified

analyses to investigate whether participants' characteristics modified response to intervention were carried out using mixed-model repeated-measures analyses. RESULTS: Sociodemographics (sex, age, and education), socioeconomic status (income), cognition (Mini-Mental State Examination), cardiovascular factors (body mass index, blood pressure, cholesterol, fasting glucose, and overall cardiovascular risk), and cardiovascular comorbidity did not modify response to intervention (P-values for interaction > .05). CONCLUSIONS: The FINGER intervention was beneficial regardless of participants' characteristics and can thus be implemented in a large elderly population at increased risk for dementia. ©The Authors.



- Samieri C, Perier MC, Gaye B, Proust-Lima C, Helmer C, Dartigues JF, Berr C, Tzourio C, Empana JP. Association of Cardiovascular Health Level in Older Age With Cognitive Decline and Incident Dementia. *JAMA*. 2018 Aug 21;320(7):657-664.

Importance: Evidence is limited regarding the relation between cardiovascular health level and dementia risk. Objective: To investigate the association between cardiovascular health level, defined using the 7-item tool from the American Heart Association (AHA), and risk of dementia and cognitive decline in older persons. Design, Setting, and Participants: Population-based cohort study of persons aged 65 years or older from Bordeaux, Dijon, and Montpellier, France, without history of cardiovascular diseases or dementia at baseline who underwent repeated in-person neuropsychological testing (January 1999-July 2016) and systematic detection of incident dementia (date of final follow-up, July 26, 2016). Exposures: The number of the AHA's Life's Simple 7 metrics at recommended optimal level (nonsmoking, body mass index <25, regular physical activity, eating fish twice a week or more and fruits and vegetables at least 3 times a day, cholesterol <200 mg/dL [untreated], fasting glucose <100 mg/dL [untreated], and blood pressure <120/80 mm Hg [untreated]; score range, 0-7) and a global cardiovascular health score (range, 0-14; poor, intermediate, and optimal levels of each metric assigned a value of 0, 1, and 2, respectively). Main Outcomes and Measures: Incident dementia validated by an expert committee and change in a composite score of global cognition (in standard units, with values indicating distance from population means, 0 equal to the mean, and +1 and -1 equal to 1 SD above and below the mean). Results: Among 6626 participants (mean age, 73.7 years; 4200 women [63.4%]), 2412 (36.5%), 3781 (57.1%), and 433 (6.5%) had 0 to 2, 3 to 4, and 5 to 7 health metrics at optimal levels, respectively, at baseline. Over a mean follow-up duration of 8.5 (range, 0.6-16.6) years, 745 participants had incident adjudicated dementia. Compared with the incidence rate of dementia of 1.76 (95% CI, 1.38-2.15) per 100 person-years among those with 0 or 1 health metrics at optimal levels, the absolute differences in incident dementia rates for 2, 3, 4, 5, and 6 to 7 metrics were, respectively, -0.26 (95% CI, -0.48 to -0.04), -0.59 (95% CI, -0.80 to -0.38), -0.43 (95% CI, -0.65 to -0.21), -0.93 (95% CI, -1.18 to -0.68), and -0.96 (95% CI, -1.37 to -0.56) per 100 person-years. In multivariable models, the hazard ratios for dementia were 0.90 (95% CI, 0.84-0.97) per additional optimal metric and 0.92 (95% CI, 0.89-0.96) per additional point on the global score. Furthermore, the gain in global cognition associated with each additional optimal metric at baseline was 0.031 (95% CI, 0.009-0.053) standard units at inclusion, 0.068 (95% CI, 0.045-0.092) units at year 6, and 0.072 (95% CI, 0.042-0.102) units at year 12. Conclusions and Relevance: In this cohort of older adults, increased numbers of optimal cardiovascular health metrics and a higher cardiovascular health score were associated with a lower risk of dementia and lower rates of cognitive decline. These findings may support the promotion of cardiovascular health to prevent risk factors associated with cognitive decline and dementia.



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