Supplementary Material

# Appendix A. methods

a. Search algorithms.

Search strategy (concepts / block building approach)

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| Overview databases and resultsDate last searched: Jun 3, 2023 |

Pubmed: 5449 records

1 "cognitive reserve\*"[Title/Abstract] OR "brain reserve\*"[Title/Abstract] OR "cognitive capacity"[Title/Abstract] OR "neural reserve"[Title/Abstract] OR "brain maintenance"[Title/Abstract] OR "cognitive resilience"[Title/Abstract] OR "brain resilience"[Title/Abstract] OR "education\*"[Title/Abstract] OR "occupation\*"[Title/Abstract] OR "leisure activit\*"[Title/Abstract] (901,558)

2 "dementia"[Title/Abstract] OR "dement\*"[Title/Abstract] OR "alzheim\*"[Title/Abstract] (277,395)

3 "risk\*"[Title/Abstract] OR "HR"[Title/Abstract] OR "hazard ratio"[Title/Abstract] (3,116,818)

4 1 and 2 and 3 (5,449)

Embase: 10773 records

#1. 'cognitive reserve'/exp OR 'cognitive reserve\*':ab,ti OR 'brain reserve\*':ab,ti OR 'cognitive capacity':ab,ti OR 'neural reserve':ab,ti OR 'brain maintenance':ab,ti OR 'cognitive resilience':ab,ti OR 'brain resilience':ab,ti OR education\*:ab,ti OR occupation\*:ab,ti OR 'leisure activit\*':ab,ti (1,132,779)

#2. 'dementia'/exp OR dementia:ab,ti OR dement\*:ab,ti OR alzheim\*:ab,ti (508,296)

#3. 'risk'/exp OR risk\*:ab,ti OR hr:ab,ti OR 'hazard ratio':ab,ti (5,320,196)

#4. #1 AND #2 AND #3 (10,773)

Web of science: 11816 records

#1 TS=("cognitive reserve\*" OR "brain reserve\*" OR "cognitive capacity" OR "neural reserve" OR "brain maintenance" OR "cognitive resilience" OR "brain resilience" OR education\* OR occupation\* OR leisure activit\*) (2,716,149)

#2 TS=(dementia OR dement\* OR Alzheim\*) (497,768)

#3 TS=(risk\* OR HR OR hazard ratio ) (5,504,687)

#4 #1 AND #2 AND #3 (11,816)

MEDLINE: 5203 records

S1 AB "cognitive reserve\*" OR "brain reserve\*" OR "cognitive capacity" OR "neural reserve" OR "brain maintenance" OR "cognitive resilience" OR "brain resilience" OR education\* OR occupation\* OR leisure activit\* (732,377)

S2 AB dementia OR dement\* OR Alzheim\*  (243,947)

S3 AB risk\* OR HR OR hazard ratio  (2,925,114)

S4 S1 AND S2 AND S3 (5,203)

b. Table A.1. List of excluded references after full-text screening

|  |  |  |  |
| --- | --- | --- | --- |
| Authors | Year | Title | Exclusion reason |
| Podewils, L. J., E. Guallar, L. H. Kuller, L. P. Fried, O. Lopez and C. G. Lyketsos | 2003 | Physical activity, APOE genotype, and dementia risk: Findings from the CHS cognition study | No full text |
| Fabrigoule, C. | 2002 | Do leisure activities protect against Alzheimer's disease? | Review |
| Ferrari, C., B. Nacmias, S. Bagnoli, I. Piaceri, G. Lombardi, S. Pradella, A. Tedde and S. Sorbi | 2014 | Imaging and cognitive reserve studies predict dementia in presymptomatic Alzheimer's disease subjects. | Review |
| Fratiglioni, L., A. Marseglia and S. Dekhtyar | 2020 | Ageing without dementia: can stimulating psychosocial and lifestyle experiences make a difference? | Review |
| Lövdén, M., L. Fratiglioni, M. M. Glymour, U. Lindenberger and E. M. Tucker-Drob | 2020 | Education and Cognitive Functioning Across the Life Span. | Review |
| Majoka, M. A. and C. Schimming | 2021 | Effect of Social Determinants of Health on Cognition and Risk of Alzheimer Disease and Related Dementias. | Review |
| Valenzuela, M. and P. S. Sachdev | 2009 | Harnessing brain and cognitive reserve for the prevention of dementia. | Review |
| Wilson, R. S. | 2005 | Mental challenge in the workplace and risk of dementia in old age: is there a connection? | Review |
| Almeida, P., A. Steptoe and D. Cadar | 2019 | MARKERS OF COGNITIVE RESERVE AND DEMENTIA INCIDENCE IN THE ENGLISH LONGITUDINAL STUDY OF AGEING. | Duplicate cohort |
| Almeida-Meza, P., A. P. Steptoe and D. Cadar | 2020 | ENGAGEMENT IN LEISURE ACTIVITIES AND DEMENTIA RISK IN THE ENGLISH LONGITUDINAL STUDY OF AGEING. | Duplicate cohort |
| Al-Najjar, J., I. Skoog, T. Hällström, S. Östling, P. Gudmundsson, L. Johansson, X. Guo and V. Sundh | 2015 | Leisure artistic and intellectual engagements and physical activity in midlife are associated with reduced risk of late-life dementia: A 38-year follow-up. | Duplicate cohort |
| Dekhtyar, S., A. Marseglia, W. Xu, A. Darin-Mattsson, H. X. Wang and L. Fratiglioni | 2018 | Similar dementia risk in APOE-ϵ4 carriers and non-carriers with high life-long cognitive reserve: A population-based cohort study. | Duplicate cohort |
| Dekhtyar, S., H. X. Wang, K. Scott, A. Goodman, I. Koupil and A. Herlitz | 2015 | A life-course study of cognitive reserve in dementia: Dementia incidence in inpatient registers and mmse test scores in a clinical study in Sweden. | Duplicate cohort |
| Epstein, E. F. | 2003 | Leisure activities and the risk of dementia. | Duplicate cohort |
| Feder, N. T., M. M. Bartley, J. I. Acosta, R. O. Roberts, D. S. Knopman, T. J. Christianson, V. S. Pankratz, M. M. Mielke, G. B. Stokin, V. J. Lowe, R. C. Petersen and Y. E. Geda | 2014 | Physical exercise and the outcome of incident dementia: The mayo clinic study of aging. | Duplicate cohort |
| Foubert-Samier, A., M. Le Goff, C. Helmer, K. Pérès, J. M. Orgogozo, P. Barberger-Gateau, H. Amieva and J. F. Dartigues | 2014 | Change in leisure and social activities and risk of dementia in elderly cohort. | Duplicate cohort |
| Gatz, M., P. Svedberg, N. L. Pedersen, J. A. Mortimer, S. Berg and B. Johansson | 2004 | Education and the risk of Alzheimer's disease: Findings from the study of dementia in Swedish twins (vol 56B, pg 292, 2001). | Duplicate cohort |
| Grande, G., I. Cova, L. Maggiore, S. Pomati, V. Cucumo, R. Ghiretti, M. Forcella, D. Galimberti, E. Scarpini, N. Vanacore, C. Mariani and F. Clerici | 2013 | High levels of participation in physical leisure activities protects MCI subjects against the risk of dementia. | Duplicate cohort |
| Hughes, T. F., C. C. H. Chang, J. Vanderbilt and M. Ganguli | 2010 | Engagement in reading and hobbies and incident dementia in the community: The MoVIES Project. | Duplicate cohort |
| Hyun, J., C. B. Hall, M. J. Katz, M. J. Sliwinski, C. Wang, A. Ezzati and R. B. Lipton | 2019 | THE ASSOCIATION BETWEEN MENTALLY CHALLENGING OCCUPATIONS AND INCIDENT DEMENTIA DIFFERS BETWEEN NON-HISPANIC WHITES AND AFRICAN-AMERICANS. | Duplicate cohort |
| Kroger, E., D. Laurin, R. Andel, J. Lindsay and R. Verreault | 2007 | Complexity of work and risk of dementia: The Canadian study of health and aging. | Duplicate cohort |
| Le Goff, M., C. Helmer, A. Foubert-Samier, P. Cowppli-Bony, C. Berr and J.-F. Dartigues | 2009 | [Activities in retired people and the risk of dementia]. | Duplicate cohort |
| Ott, A., C. T. van Rossum, F. van Harskamp, H. van de Mheen, A. Hofman and M. M. Breteler | 1999 | Education and the incidence of dementia in a large population-based study: the Rotterdam Study. | Duplicate cohort |
| Sanders, A. and J. Verghese | 2007 | Leisure activities and the risk of dementia in the elderly. | Duplicate cohort |
| Scarmeas, N., J. A. Luchsinger, N. Schupf, A. M. Brickman, S. Cosentino, M. X. Tang and Y. Stern | 2009 | Physical activity, diet, and risk of Alzheimer disease. | Duplicate cohort |
| Sommerlad | 2021 | Leisure Activity Participation and Risk of Dementia An 18-Year Follow-up of the Whitehall II Study (vol 95, pg e2803, 2020). | Duplicate cohort |
| Sommerlad, A., S. Sabia, A. Singh-Manoux, G. Lewis and G. Livingston | 2019 | ASSOCIATION OF SOCIAL NETWORK CONTACT WITH RISK OF DEMENTIA AND COGNITIVE DECLINE: 28-YEAR FOLLOW-UP OF THE WHITEHALL II COHORT STUDY. | Duplicate cohort |
| Cedar, D., C. Lassale, H. Davies, D. J. Llewellyn, D. Batty and A. Steptoe | 2018 | Individual and Area-Based Socioeconomic Factors Associated With Dementia Incidence in England Evidence From a 12-Year Follow-up in the English Longitudinal Study of Ageing. | Duplicate cohort |
| Takasugi, T., T. Tsuji, M. Hanazato, Y. Miyaguni, T. Ojima and K. Kondo | 2021 | Community-level educational attainment and dementia: a 6-year longitudinal multilevel study in Japan. | Duplicate cohort |
| Tyas, S., E. Hack and K. Riley | 2013 | Academic achievement in high school english courses and risk of Alzheimer's disease and dementia: Findings from the nun study. | Duplicate cohort |
| Deckers, K., D. Cadar, M. P. J. van Boxtel, F. R. J. Verhey, A. Steptoe and S. Köhler | 2019 | Modifiable Risk Factors Explain Socioeconomic Inequalities in Dementia Risk: Evidence from a Population-Based Prospective Cohort Study. | Duplicate cohort |
| Gilsanz, P., E. R. Mayeda, C. W. Eng, O. L. Meyer, M. Glymour and R. A. Whitmer | 2019 | CONCURRENCE BETWEEN OWN AND SPOUSAL EDUCATION AND DEMENTIA RISK IN A DIVERSE COHORT. | Duplicate cohort |
| Feder, N. T., M. M. Bartley, J. I. Acosta, R. O. Roberts, D. S. Knopman, T. J. Christianson, V. S. Pankratz, M. M. Mielke, G. B. Stokin, V. J. Lowe, R. C. Petersen and Y. E. Geda | 2014 | Physical exercise and the outcome of incident dementia: The mayo clinic study of aging. | Duplicate cohort |
| Dartiques, J. F., L. J. Launer, K. Andersen, A. Ott, L. Letenneur, P. Kragh-Sorensen, L. A. Amaducci, A. Lobo and J. M. Martinez-Lage | 1997 | The relation of education to the risk for incident Alzheimer's disease. | Duplicate cohort |
| Rodriguez, F. S., M. P. Aranda, D. A. Lloyd and W. A. Vega | 2018 | Racial and Ethnic Disparities in Dementia Risk Among Individuals With Low Education. | Duplicate cohort |
| van Oijen, M., F. J. de Jong, A. Hofman, P. J. Koudstaal and M. M. B. Breteler | 2007 | Subjective memory complaints, education, and risk of Alzheimer's disease. | Duplicate cohort |
| Vinkers, D. J., J. Gussekloo and R. G. Westendorp | 2003 | Leisure activities and the risk of dementia. | Duplicate cohort |
| Wang, H. X., S. Dekhtyar, L. Fratiglioni and A. Herlitz | 2015 | Childhood school performance, education, and occupational complexity: A life course study from the kungsholmen project. | Duplicate cohort |
| Xu, H., R. Yang, C. Dintica, X. Qi, R. Song, D. A. Bennett and W. Xu | 2020 | Association of lifespan cognitive reserve indicator with the risk of mild cognitive impairment and its progression to dementia. | Duplicate cohort |
| Xu, H., R. Yang, X. Qi, C. S. Dintica, R. Song, D. A. Bennett and W. Xu | 2019 | HIGH LIFESPAN COGNITIVE RESERVE IS ASSOCIATED WITH A REDUCED DEMENTIA RISK, INDEPENDENTLY OF BRAIN PATHOLOGIES. | Duplicate cohort |
| Deckers, K., D. Cadar, M. P. J. van Boxtel, F. R. J. Verhey, A. Steptoe and S. Köhler | 2019 | Modifiable Risk Factors Explain Socioeconomic Inequalities in Dementia Risk: Evidence from a Population-Based Prospective Cohort Study. | Duplicate cohort |
| Feder, N. T., M. M. Bartley, J. I. Acosta, R. O. Roberts, D. S. Knopman, T. J. Christianson, V. S. Pankratz, M. M. Mielke, G. B. Stokin, V. J. Lowe, R. C. Petersen and Y. E. Geda | 2014 | Physical exercise and the outcome of incident dementia: The mayo clinic study of aging. | Duplicate cohort |
| Yang, R., H. Xu, X. Qi, C. S. Dintica, D. A. Bennett and W. Xu | 2019 | HIGH LIFESPAN COGNITIVE RESERVE REDUCES THE RISK OF MILD COGNITIVE IMPAIRMENT AND DECELERATES ITS PROGRESSION TO DEMENTIA. | Duplicate cohort |
| Almeida-Meza, P., A. Steptoe and D. Cadar | 2021 | Is Engagement in Intellectual and Social Leisure Activities Protective Against Dementia Risk? Evidence from the English Longitudinal Study of Ageing. | Period unknown |
| Dufouil, C., E. Pereira, G. Chêne, M. M. Glymour, A. Alpérovitch, E. Saubusse, M. Risse-Fleury, B. Heuls, J. C. Salord, M. A. Brieu and F. Forette | 2013 | Older age at retirement is associated with decreased risk of dementia: Analysis of a health care insurance database of self-employed workers. | Period unknown |
| Fancourt, D., A. Steptoe and D. Cadar | 2020 | Community engagement and dementia risk: time-to-event analyses from a national cohort study. | Period unknown |
| Kitamura, K., Y. Watanabe, K. Kabasawa, A. Takahashi, T. Saito, R. Kobayashi, R. Takachi, R. Oshiki, S. Tsugane, M. Iki, A. Sasaki, O. Yamazaki, K. Watanabe and K. Nakamura | 2022 | Leisure-Time and Non-Leisure-Time Physical Activities are Dose-Dependently Associated With a Reduced Risk of Dementia in Community-Dwelling People Aged 40-74 Years: The Murakami Cohort Study. | Period unknown |
| Sanders, A. E., C. B. Hall, M. J. Katz and R. B. Lipton | 2012 | Non-native language use and risk of incident dementia in the elderly. | Period unknown |
| Shen, C., E. Rolls, W. Cheng, J. Kang, G. Dong, C. Xie, X.-M. Zhao, B. Sahakian and J. Feng | 2022 | Associations of Social Isolation and Loneliness With Later Dementia. | Period unknown |
| Sommerlad, A., S. Sabia, G. Livingston, M. Kivimäki, G. Lewis and A. Singh-Manoux | 2020 | Leisure activity participation and risk of dementia: An 18-year follow-up of the Whitehall II Study. | Period unknown |
| Summers, M., M. Valenzuela, J. Summers, K. Ritchie, T. Dickson, A. Robinson and J. Vickers | 2012 | The tasmanian healthy brain study (THBS): Does late-life education prevent age-related cognitive decline and dementia? | Period unknown |
| Then, F. S., T. Luck, K. Heser, A. Ernst, T. Posselt, B. Wiese, S. Mamone, C. Brettschneider, H.-H. König, S. Weyerer, J. Werle, E. Mösch, H. Bickel, A. Fuchs, M. Pentzek, W. Maier, M. Scherer, M. Wagner and S. G. Riedel-Heller | 2017 | Which types of mental work demands may be associated with reduced risk of dementia? | Period unknown |
| Xu, H., Yang, R., Dintica, C., Qi, X., Song, R., Bennett, D.A., Xu, W. | 2020 | Association of lifespan cognitive reserve indicator with the risk of mild cognitive impairment and its progression to dementia | Period unknown |
| Dekhtyar, S., Marseglia, A., Xu, W., Darin-Mattsson, A., Wang, H.-X., Fratiglioni, L. | 2019 | Genetic risk of dementia mitigated by cognitive reserve: A cohort study | Period unknown |
| Zabar, Y., M. Corrada, J. Fozard, P. Costa and C. Kawas | 1996 | Does frequent participation in cognitively demanding leisure activities reduce the risk of developing dementia? | Period unknown |
| Al Hazzouri, A. Z., M. N. Haan, J. D. Kalbfleisch, S. Galea, L. D. Lisabeth and A. E. Aiello | 2011 | Life-Course Socioeconomic Position and Incidence of Dementia and Cognitive Impairment Without Dementia in Older Mexican Americans: Results From the Sacramento Area Latino Study on Aging. | Period unknown |
| Zhang, Y., G. Natale and S. Clouston | 2021 | The Characteristics of Social Network Structure in Later Life in Relation to Incidence of Mild Cognitive Impairment and Conversion to Probable Dementia. | Lack of data |
| Ka Yan Lai, Chris Webster, Sarika Kumari, John E J Gallacher, Chinmoy Sarkar | 2022 | Association between individual-level socioeconomic position and incident dementia using UK Biobank data: a prospective study. | Lack of data |
| Allegri, R. F., F. E. Taragano, H. Krupitzki, C. M. Serrano, C. Dillon, D. Sarasola, M. Feldman, G. Tufró, M. Martelli and V. Sanchez | 2010 | Role of cognitive reserve in progression from mild cognitive impairment to dementia. | Lack of data |
| Fankhauser, S., Forstmeier, S., Maercker, A., Luppa, M., Luck, T., Riedel-Heller, S.G. | 2015 | Risk of dementia in older adults with low versus high occupation-based motivational processes: differential impact of frequency and proximity of social network | Lack of data |
| Tom, S.E., Phadke, M., Hubbard, R.A., Crane, P.K., Stern, Y., Larson, E.B. | 2020 | Association of Demographic and Early-Life Socioeconomic Factors by Birth Cohort With Dementia Incidence Among US Adults Born Between 1893 and 1949 | Lack of data |
| Shadlen, M.-F., D. Siscovick, A. L. Fitzpatrick, C. Dulberg, L. H. Kuller and S. Jackson | 2006 | Education, cognitive test scores, and black-white differences in dementia risk. | Lack of data |
| Kaup, A., E. Simonsick, T. Harris, S. Satterfield, A. Metti, H. Ayonayon, S. Rubin and K. Yaffe | 2013 | Limited literacy predicts dementia incidence among older adults. | Lack of data |
| Hendrie, H. C., V. Smith-Gamble, K. A. Lane, C. Purnell, D. O. Clark and S. Gao | 2018 | The Association of Early Life Factors and Declining Incidence Rates of Dementia in an Elderly Population of African Americans. | Lack of data |
| Letenneur, L., V. Gilleron, D. Commenges, C. Helmer, J. M. Orgogozo and J. F. Dartigues | 1999 | Are sex and educational level independent predictors of dementia and Alzheimer's disease? Incidence data from the PAQUID project. | Lack of data |
| Ojagbemi, A., T. Bello and O. Gureje | 2016 | Cognitive Reserve, Incident Dementia, and Associated Mortality in the Ibadan Study of Ageing. | Lack of data |
| Santabárbara, J., A. C. Gracía-Rebled, R. López-Antón, C. Tomás, E. Lobo, G. Marcos and A. Lobo | 2019 | The effect of occupation type on risk of Alzheimer's disease in men and women. | Lack of data |
| Takasugi, T., T. Tsuji, M. Hanazato, Y. Miyaguni, T. Ojima and K. Kondo | 2021 | Community-level educational attainment and dementia: a 6-year longitudinal multilevel study in Japan. | Lack of data |
| Appel, A. M., H. Brønnum-Hansen, A. H. Garde, Å. Hansen, K. Ishtiak-Ahmed, S. Islamoska, E. L. Mortensen, M. Osler and K. Nabe-Nielsen | 2022 | Socioeconomic Position and Late-Onset Dementia: A Nationwide Register-Based Study. | Lack of data |
| Rovio, S., B. Winblad, H. Soininen, J. Tuomilehto, A. Nissinen and M. Kivipelto | 2008 | Physical Activity Modifies Risk of Dementia and Alzheimer's Disease. | Lack of data |
| Donley, G. A. R., E. Lönnroos, T.-P. Tuomainen and J. Kauhanen | 2018 | Association of childhood stress with late-life dementia and Alzheimer's disease: the KIHD study. | Not CR enhancement factors |
| Gilsanz, P., C. P. Quesenberry, Jr., E. R. Mayeda, M. M. Glymour, S. T. Farias and R. A. Whitmer | 2019 | Stressors in Midlife and Risk of Dementia: The Role of Race and Education. | Not CR enhancement factors |
| Grande, G., D. L. Vetrano, I. Cova, S. Pomati, D. Mattavelli, L. Maggiore, V. Cucumo, R. Ghiretti, N. Vanacore, C. Mariani and D. Rizzuto | 2018 | Living Alone and Dementia Incidence: A Clinical-Based Study in People With Mild Cognitive Impairment. | Not CR enhancement factors |
| Goldberg, T. E., J. Choi, S. Lee, B. Gurland and D. P. Devanand | 2021 | Effects of restriction of activities and social isolation on risk of dementia in the community. | Not CR enhancement factors |
| Johansson, L., X. Guo, M. Norton, T. Hallstrom, M. Waern and I. Skoog | 2011 | Experiences of adverse life events and risk of dementia: A 38-year longitudinal population study of women. | Not CR enhancement factors |
| Wang, H.-X., M. Wahlberg, A. Karp, B. Winblad and L. Fratiglioni | 2012 | Psychosocial stress at work is associated with increased dementia risk in late life. | Not CR enhancement factors |
| Basu, R. | 2013 | Education and Dementia Risk: Results From the Aging Demographics and Memory Study. | Not longitudinal cohort |
| Petroianu, A., H. X. d. M. Capanema, M. M. Q. Silva and N. T. P. Braga | 2010 | Atividade física e mental no risco de demência em idosos. | Not longitudinal cohort |
| Russell, E. R., K. Stewart, D. F. Mackay, J. MacLean, J. P. Pell and W. Stewart | 2019 | Football's InfluencE on Lifelong health and Dementia risk (FIELD): protocol for a retrospective cohort study of former professional footballers. | Not longitudinal cohort |
| Zuelke, A. E., M. Luppa, S. Roehr, M. Weissenborn, A. Bauer, F.-A. Z. Samos, F. Kuehne, I. Zoellinger, J. Doehring, C. Brettschneider, A. Oey, D. Czock, T. Frese, J. Gensichen, W. E. Haefeli, W. Hoffmann, H. Kaduszkiewicz, H.-H. Koenig, J. R. Thyrian, B. Wiese and S. G. Riedel-Heller | 2021 | Association of mental demands in the workplace with cognitive function in older adults at increased risk for dementia. | Not longitudinal cohort |
| Juul Rasmussen I, Rasmussen KL, Thomassen JQ, Nordestgaard BG, Schnohr P, Tybjærg-Hansen A, Frikke-Schmidt R | 2022 | Physical activity in leisure time and at work and risk of dementia: A prospective cohort study of 117,616 individuals. | Not cognitive reserve |
| de Bruijn, R.F.A.G., Schrijvers, E.M.C., de Groot, K.A., Witteman, J.C.M., Hofman, A., Franco, O.H., Koudstaal, P.J. & Ikram, M.A. | 2013 | The association between physical activity and dementia in an elderly population: the Rotterdam Study. | Not cognitive reserve |
| Najar, J., Östling, S., Gudmundsson, P., Sundh, V., Johansson, L., Kern, S., Guo, X., Hällström, T. & Skoog, I. | 2019 | Cognitive and physical activity and dementia: A 44-year longitudinal population study of women. | Not cognitive reserve |
| Ogino, E., Manly, J.J., Schupf, N., Mayeux, R. & Gu, Y. | 2019 | Current and past leisure time physical activity in relation to risk of Alzheimer's disease in older adults. | Not cognitive reserve |
| Zhu J, Ge F, Zeng Y, Qu Y, Chen W, Yang H, Yang L, Fang F, Song H | 2022 | Physical and Mental Activity, Disease Susceptibility, and Risk of Dementia: A Prospective Cohort Study Based on UK Biobank. | Not cognitive reserve |
| Sundström, A., D. E. Sörman, P. Hansson, J. K. Ljungberg and R. Adolfsson | 2020 | Mental Demands at Work and Risk of Dementia. | Not cognitive reserve |
| Tan, X., A. Lebedeva, T. Åkerstedt and H.-X. Wang | 2022 | Sleep mediates the association between stress at work and incident dementia: study from the Survey of Health, Ageing and Retirement in Europe. | Not cognitive reserve |
| Kunutsor, S. K., J. A. Laukkanen, J. Kauhanen and P. Willeit | 2021 | Physical activity may not be associated with long-term risk of dementia and Alzheimer's disease. | Not cognitive reserve |
| Garcia, J., K. Erickson, C. Raji, O. Lopez, A. Newman, C. Rosano and L. Kuller | 2011 | Physical activity is predictive of dementia but not mortality. | Not cognitive reserve |
| Ihira, H., N. Sawada, M. Inoue, N. Yasuda, K. Yamagishi, H. Charvat, M. Iwasaki and S. Tsugane | 2022 | Association Between Physical Activity and Risk of Disabling Dementia in Japan. | Not cognitive reserve |
| Almeida, O. P., B. B. Yeap, H. Alfonso, G. J. Hankey, L. Flicker and P. E. Norman | 2012 | Older men who use computers have lower risk of dementia. | Not cognitive reserve |
| Arafa, A., E. S. Eshak, K. Shirai, D. Cadar, H. Iso, T. Tsuji, S. Kanamori and K. Kondo | 2021 | Impact of various intensities and frequencies of non-occupational physical activity on the risk of dementia among physically independent older adults: the Japan Gerontological Evaluation Study. | Not cognitive reserve |
| Bokenberger, K., A. Sjölander, A. K. Dahl Aslan, I. K. Karlsson, T. Åkerstedt and N. L. Pedersen | 2017 | Midlife shift work and risk of incident dementia. | Not cognitive reserve |
| Cadar, D., R. A. Hackett, M. Mischie, D. J. Llewellyn, G. D. Batty and A. Steptoe | 2017 | Association of physical activity as a distinctive feature of clustering of lifestyle behaviours with dementia risk: Evidence from the English Longitudinal Study of Ageing. | Not cognitive reserve |
| Camozzato, A., C. Godinho, J. Varela, C. Kohler, J. Rinaldi and M. L. Chaves | 2015 | The complex role of having confidant on the development of Alzheimer's disease in a community-based cohort of older people in Brazil. | Not cognitive reserve |
| Dhana, K., D. A. Evans, K. B. Rajan, D. A. Bennett and M. C. Morris | 2019 | IMPACT OF HEALTHY LIFESTYLE FACTORS ON THE RISK OF ALZHEIMER'S DEMENTIA: FINDINGS FROM TWO PROSPECTIVE COHORT STUDIES. | Not cognitive reserve |
| Verghese, J., Lipton, R.B., Katz, M.J., Hall, C.B., Derby, C.A., Kuslansky, G., Ambrose, A.F., Sliwinski, M. & Buschke, H. | 2003 | Leisure activities and the risk of dementia in the elderly. | Not cognitive reserve |
| Krell-Roesch, J., Feder, N.T., Roberts, R.O., Mielke, M.M., Christianson, T.J., Knopman, D.S., Petersen, R.C. & Geda, Y.E. | 2018 | Leisure-Time Physical Activity and the Risk of Incident Dementia: The Mayo Clinic Study of Aging. | Not cognitive reserve |
| Kishimoto, H., Ohara, T., Hata, J., Ninomiya, T., Yoshida, D., Mukai, N., Nagata, M., Ikeda, F., Fukuhara, M., Kumagai, S., Kanba, S., Kitazono, T. & Kiyohara, Y. | 2016 | The long-term association between physical activity and risk of dementia in the community: the Hisayama Study.  | Not cognitive reserve |
| Forstmeier, S., Maercker, A., Maier, W., van den Bussche, H., Riedel-Heller, S., Kaduszkiewicz, H., Pentzek, M., Weyerer, S., Bickel, H., Tebarth, F., Luppa, M., Wollny, A., Wiese, B., Wagner, M. | 2012 | Motivational reserve: motivation-related occupational abilities and risk of mild cognitive impairment and Alzheimer disease. | Not cognitive reserve |
| Huang, A. R., K. L. Strombotne, E. M. Horner and S. J. Lapham | 2018 | Adolescent Cognitive Aptitudes and Later-in-Life Alzheimer Disease and Related Disorders. | Not cognitive reserve |
| Wu, W., Ding, D., Zhao, Q., Wang, R., Liang, X., Xiao, Z., Luo, J., Guo, Q. & Hong, Z. | 2020 | Medium-to-High Late-Life Physical Activity Is Associated with Lower Risk of Incident Dementia: The Shanghai Aging Study. | Not cognitive reserve |
| Ravaglia, G., Forti, P., Lucicesare, A., Pisacane, N., Rietti, E., Bianchin, M. & Dalmonte, E. | 2008 | Physical activity and dementia risk in the elderly - Findings from a prospective Italian study. | Not cognitive reserve |
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# Appendix B. Assessment of risk of bias results

a. Figure B.1. Funnel plots for the association of early-life, middle-life, late-life CR with risk of dementia

 

B.

A.



C.

The log HRs are plotted against the standard error of the logarithm of the HR. The dashed lines depict the logarithm of the summary HR with its 95% confidence interval. (A) early-life CR. (B) middle-life CR. (C) late-life CR.

HR, hazard ratio; CR, cognitive reserve.

b. Figure B.2. Begg and Egger test for publication bias in studies reporting early-life CR and risk of dementia



c. Figure B.3. Begg and Egger test for publication bias in studies reporting middle-life CR and risk of dementia



d. Figure B.4. Begg and Egger test for publication bias in studies reporting late-life CR and risk of dementia



e. Figure B.5. Trim-and-fill method in studies reporting middle-life and late-life CR and risk of dementia



A.

B.

1. middle-life CR. (B) late-life CR.

# Appendix C. Sensitivity analyses.

Figure C.1. Fixed-effects meta-analysis of risk of dementia according to CR in period of life.

a. Association of early-life CR with risk of dementia in different proxies.



b. Association of middle-life CR with risk of dementia in different proxies.



c. Association of late-life CR with risk of dementia in different proxies.



Figure C.2. Sensitivity analysis given named study is omitted.

a. Association of early-life CR with risk of dementia



b. Association of middle-life CR with risk of dementia



c. Association of late-life CR with risk of dementia

