**Table S4.** Characterization of the included studies in the systematic review presented in alphabetical order

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  | **Objective/Focus** | **Study population and sample size** | **Follow up time** | **Health outcome and measure** | **Intervenient variable** | **Statistical analysis** | **Results** | **Conclusion** | **Effect of retirement** |
|  | |
| **1** | **Byles et al. (2016)**  **Australia** | | Longitudinal associations between retirement with psychological distress and physical dysfunction by gender | N=21,608  (M: 10,531; W:11,077) 55–69 years | 2-4 years (2006/2008- 2010) | PF: SF-36 | Gender | Generalized estimating equations (GEE) | Retirement in men was associated with a 25% relative increase in mean physical dysfunction score (p < 0.001). For women, retirement was associated with a 17% increase in mean physical dysfunction score (p < 0.001) | Retirement was associated with increased physical dysfunction even after adjustment for comorbid conditions. The increase in physical dysfunction was higher for men than women. | (-) |
| **2** | | **Dinh et al. (2022) Australia** | Comparison of health and economic outcomes according to retirement status | N= 6,177  (M: 3,039; W:3,138)  50-70 years | 14 years (2001-2015). | PF and General Health: 10 items of the SF-36 | Economic outcome variables | Random effects estimator with maximum likelihood estimation technique. | For employed participants, general health declined by 0.22 SD (*p* < 0.01), and the number of health conditions increased slightly by 0.06 SD (*p* < 0.01). Health outcomes on non-employed people deteriorated faster than their employed counterpart’s | Employed participants showed a gradual decline in all health outcomes, except for physical functioning. Health outcomes on non-employed people deteriorated faster than their employed counterparts over the same period. | (-) |
| **3** | | **Hallerod et al. (2013) Swiss** | Analysis of the effects of specific routes into retirement and post-retirement health and well-being of older people. | N= 589,  55-75 years | 10 years (1993-2003) | Poor subjective health/Frequent and non-trivial health problems/Restricted mobility/ Pain: Instrument developed by the authors | Transfer income ratio (TIR) as a proxy for retirement circumstances. Pre-retirement health | Structural equation modelling (SEM) | Preretirement health is the main explicative factor for post-retirement global health and well-being (r= 0.890\*\*\*), and the route of only sickness benefit (r=0.100\*) The effect of retirement transition circumstances is almost entirely absent. | The effect of retirement transition circumstances is almost entirely absent: TIR measure, specific exit routes, and time in retirement have any substantial impact on health and well-being. The main explanation for post-retirement global health and well-being was pre-retirement health. | 0 |
| **4** | | **Haapanen et al. (2022)**  **Finland** | Association between retirement and post-retirement PF trajectories in higher occupational groups and managers | n=1,698 retired business executives and managers 66-81 years | 10 years (2000-2010 | PF: RAND-36 Health Survey v.1.0 (Identical with Short Form SF-36). Based on that, five health trajectories were identified named: ‘intact’, ‘high stable’, ‘high and declining’, ‘intermediate and declining’ and ‘consistently low’ |  | Covariate-adjusted multinomial regression models to estimate multinomial Odds Ratios (mOR) | A one-year increase in retirement age associated with a decreased likelihood of being classified in the ‘consistently low’ (adjusted mOR = 0.82; 95% CI 0.70, 0.97; P = 0.007), ‘intermediate and declining’ (adjusted mOR = 0.89; 95% CI 0.83, 0.96; P = 0.002), ‘high and declining’ (adjusted mOR = 0.92; 95% CI 0.87, 0.98; P = 0.006) trajectories, relative to the ‘intact’ PF trajectory. | Retirement at older age was associated with better PF trajectories among former executives and managers in old age. There are no independent effects of the retirement process. | (-) |
| **5** | | **Kalousova & Mendes Leon (2014)**  **10 European countries** | Associations between frailty in later life, and negative psychosocial working conditions, considering the role of retirement. | N=2,475 older European workers and recent retirees over 50 years old. | 7 years (2004-2010/2011) | Frailty: Five criteria of frailty phenotype. | Negative psychosocial working conditions (high effort, low reward, low control) | Multilevel linear models predicting between-wave change in frailty, controlling for frailty score at baseline. | Both high-effort and low-reward jobs were associated with a 0.10 point increase in frailty. | Persons in high or average reward at work at baseline, who retired by follow-up, show and increase in frailty. Low reward jobs had the most detrimental consequences for health when a respondent did not retire. | (-) |
| **6** | | **Kang & Kim (2014)**  **Korea** | Association between voluntary or involuntary retirement and stroke or cardiovascular disease (CVD) development. | N= 10,254, 45-65 years old. | 6 years; 2006-2012. | Reported physician-diagnosis of stroke and CVD on a follow-up questionnaire. | Lifestyle behavior. Income level | Cox proportional hazard models | Stroke: Still employed: reference. Voluntary retírement HR: 3.72 Involuntary job loss HR: 4.41. CVD: Still employed: reference. Voluntary retirement HR: 1.83 Involuntary job loss HR: 2.44. | Compared with still employed, voluntary retirement and involuntary job loss had more serious health effects among middle-aged to older male workers. These effects are higher in involuntary retirement compared with voluntary job loss | (-) |
| **7** | | **Lallukka et al. (2023) Finland** | To examine long-term trajectories in PF by occupational class and contribution of working conditions and behavioral risk factors to the trajectories among female transitioning to old-age or disability retirement. | N=3,901 Women  40-60 years | 15-17 years 2000−2002/2017 | PF: RAND-36 PF subscale. | Working conditions and behavioral and risk factors. Occupational class | Mixed-effect growth curve models. | By retirement transition, PF declined and occupational class inequalities emerged, the predicted scores being 86.1 (95% CI: 85.2–86.9) for higher class and 82.2(81.5–83.0) for lower class retirees. | Retirees´ PF declined before retirement and continued to decline among old-age retirees. Occupational Class inequalities in physical functioning widened after old-age retirement and narrowed after disability retirement. | (-) |
| **8** | | **Mänty et al. (2018)**  **Finland** | Associations between transition into statutory, disability and part-time retirement, and changes in PF | n= 8,960.  40 -60 years | 12 years, 2000-2012. | PF and mental health functioning: Short-Form 36 (SF-36) | A checklist of self-reported major diseases and ‘diseases’ likely to affect PFl or mental functioning. | Linear regression analyses with generalized estimation equations (GEEs) controlling for the intra-individual correlation between repeated measurements. | Statutory and part-time retirement were associated with no or only small changes in PF during retirement transition (β=0.10, 95% CI 0.3-0.5 and 1.0, 1.8 -0.1, respectively). Higher occupational class before retirement and being physically inactive during the retirement transition were associated with greater decline in PF | Statutory and part-time retirement were associated with no or only small changes in physical health functioning during retirement transition | (-)  Indirect effect in higher occupational class |
| **9** | | **Mänty et al. (2016) Finland** | Association between pre-retirement physical working conditions and changes in PF during the retirement transition process. | n = 8,960  40 years old. | 12 years, 2000-2012. | PF: SF-36. | Working conditions: workload, computer work and occupational environmental hazards | Linear regression analysis and repeated measures analysis using PROC MIXED procedure | During the retirement transition process, PF in the higher exposure groups improved significantly compared to the lower exposure groups. | Lower post-retirement PF among those in the highest as compared to the lower exposure to adverse physical working conditions groups. Retirees with higher before retirement improved their PF after retirement. | (+/-)  Indirect effect of adverse physical working conditions |
| **10** | | **Nie et al. (2019) USA** | Association between employment status (including employed, retired, temporary unemployed, and never employed) and the risk of all-cause and cause-specific mortality in US adults. | N=282,364, 18 to 65 years old | 12 years, 2001-2013. | All-cause and cause-specific mortality classified according to the ICD-10. Self-reported physician-diagnosed diseases. | Lifestyle behaviors: smoking status, alcohol intake, body mass index (BMI) | Multivariate Cox proportional hazards regression model. | Compared with employed participants, temporary unemployed, never employed, or retired participants faced an increased risk for all-cause mortality (HR): 1.76, 95% CI: 1.67- 1.86), and cause-specific mortality. | Retired, temporarily unemployed, and never employed were strongly associated with higher mortality. | (-) |
| **11** | | **Okamoto et al. (2018) Japan** | Average treatment effect of working past the current retirement age on the health of Japanese men. | N= 1,288, Japanese men 60 years or older. | 15 years, 1987-2002 | Four health outcomes: death, cognitive decline, stroke and diabetes: self-reported symptoms based on a diagnosis by a medical professional or by the participant. | Socioeconomic data and proportion within one of five longest-held employment types. | Propensity score method to estimate the effects on health of being in employment when older than 60 years. | Compared with not employed, employed lived 1.91 years longer (95%CI: 0.70 to 3.11), had an additional 2.22 years (95% CI: 0.27 to 4.17) before experiencing cognitive decline, and had a longer period before the onset of diabetes and stroke of 6.05 years (95% CI: 4.44 to 7.65) and 3.35 years (95% CI: 1.42 to 5.28), respectively. | Being in paid work in later life benefits both mortality and some morbidity outcomes. The estimated average treatment effects indicate that extending working lives benefits health. | (-) |
| **12** | | **Pedron et al. (2020) Germany** | Causal effect of retirement on risk factors for cardiovascular, metabolic disease and subjective health indicators. | N=11,168, 45–80 years | 18 years (1995-2013) | Biomedical risk factors for chronic cardio-metabolic disease: lab tests. Subjective health status: SF12 questionnaire. | Sex/education/living alone/lifestyle behaviors/medications | Parametric regression discontinuity design (RDD) based on age thresholds for pension eligibility. | Increase in BMI in early retirees [β = 1.11, p <.05] and an increase in CHO/HDL in regular retirees [β = .47, p < 0.05]. Diastolic and systolic blood pressure increase after retirement (p < 0.01). | Retirement impacts different risk factors for chronic disease, depending on timing, sex, and education. Regular male, early females, and low-educated retirees are potential high-risk groups for worsening risk factors after retirement. | (-) |
| **13** | | **Sato et al. (2023)**  **35 countries** | Association of retirement with CVD and various risk factors and to provide a holistic view using data from | N= 106.927, 50–70 years. | Follow-up period of 6.7 years. | Heart disease and stroke: medical evaluation. CVD risk factors: hypertension, diabetes, obesity, physical inactivity, smoking, IMC and binge drinking. | Education/physical activity | Linear probability models estimated by the fixed-effects instrumental variable (FEIV) method with the two-stage least squares procedure. | 2.2%-point decrease in the risk of heart disease [coefficient .022 (95% CI: -.031 to -.012)] and a 3.0%-point decrease in physical inactivity [-.030 (-.049 to -.010)] among retirees, compared with workers. In both sexes, retirement was associated with a decreased heart disease risk. | Retirement was associated with a reduced risk of heart disease on average. Some associations of retirement with CVD and risk factors appeared heterogeneous by individual characteristics. | (+) |
| **14** | | **Stenholm et al. (2014)**  **USA** | Association of sociodemographic characteristics, lifestyle factors and chronic diseases with PF trajectories in full-time work and retirement | N= 17,844, 65-85 years | Average of 5.6 years (1992-2010) | PF: score made up of 10 items: difficulties in mobility, arm functions, and fine-tuned motor function, self-assessed on 10 tasks. | Sociodemographic factors/lifestyle behaviors | Linear regression analyses with generalized estimation equations. | PF difficulties increased every 10 years by 0.17 (95% CI .04 to .29) when in full-time work and by 0.46 (95% CI .41 to .50) in retirement after adjusting for covariables. | PF declines faster in retirement than in full-time work in employees aged 65 years or older, and the difference is not explained by the absence of chronic diseases and lifestyle-related risk | (-) |
| **15** | | **Stevens et al. (2021)**  **England** | Whether belonging to more social groups supports people to be physically active following retirement and confers physical health benefits as a result | N=243 (M=125, W=118)  55–70 years | A six-year follow-up | Physical health through three measures: subjective health, walking speed (an indicator of frailty) and total number the onset of chronic health conditions (self-reported). | Social group memberships/ physical activity | Series of binary logistic regressions and squares regression model. | Indirect relationship between post-retirement group memberships, physical activity, and the onset of chronic health conditions (b =.03, CI [0.06, 0.003]. Post-retirement group memberships predicted greater physical activity (b = .20, p = .009), and physical activity, predicted a decreased frequency of the onset of chronic health conditions 4 years later (b=.15, p = .011). | More group memberships after retirement consistently predicted both subjective and objective indicators of greater physical health via greater physical activity. | (+/-)  Indirect effect of group membership and physical activity |
| **16** | | **van den Bogaard & Henkens (2018) European countries and Israel** | Effect of retirement on physical and mental health and its relationship with experienced physical and psychological job demands | N=9092, 50–70 years old. | Two years (2011 - 2013) | Presence of heart problems, stroke or cerebral vascular disease; diabetes; lung problems; arthritis or rheumatism; cancer or malignant tumor; ulcers; Parkinson's disease; cataracts; hip or femoral fracture; other conditions | Job demands | Descriptive statistics, logistic regression, and ordinary least squares regression model | Retirement from jobs with high physical demands leads to a relative improvement in overall self-rated health compared to those who remain at work. No health effects measured as the presence of physical health problems. | Pre-retirement job demands are important in how retirement affects health; physical demands seem primarily related to physical health benefits. | (+/-)  Indirect effect of job demands |
| **17** | | **Wu et al. (2016)** | Association between retirement age and mortality among healthy and unhealthy retirees | N=2956 participants, over 51 years old | Data collected in 1992 and 2010 | Mortality: interview or a spouse/partner’s core interview. Information on mortality was available through 2011. | Health status prior to retirement | Cox model | Among healthy retirees, a 1-year older age at retirement was associated with an 11% lower risk of all-cause mortality (95% CI 8% to 15%). Similarly, unhealthy retirees (n=1022) had a lower all-cause mortality risk when retiring later (HR 0.91, 95% CI 0.88 to 0.94). | Early retirement may be a risk factor for mortality | (-) |
| **18** | | **Xue et al. (2017) China** | Associations between retirement and cardiovascular disease risk: systolic blood pressure, diastolic blood pressure, waist circumference, body mass index, smoking status, and alcohol consumption | N=1,084 Age not reported | 20 years (1989-2011) | Systolic blood pressure (SBP), diastolic blood pressure (DBP), waist circumference, body mass index, and smoking status. | Sex  Urbanicity | Linear regression and logistic regression, with 2 splines separated at the year of retirement. | Retirement was accompanied by a lower DBP, a slowdown in the increase of both SBP and WC over time, and a reduction in the probability of being a heavy alcohol drinker. There was no association between retirement and BMI or smoking. | Retirement may be beneficial for blood pressure, central obesity, and alcohol consumption in China | (+) |
| **19** | | **Yuan et al. (2021) China** | Effects of the delayed retirement initiative, social health insurance system, and their interaction on the physical health of older people. | n=19,816 over 45 years old | Three years (2015-2018) | Physical functioning limitation assessed by 7 items | Social health insurance | Regressions adjusted with robust standards and errors on individual. | Delaying retirement can alleviate PF limitation (−0.347, p-value < 0.01, 95% CI = [−0.381, −0.313]). All types of social health insurance buffer the beneficial impact of late retirement on the physical health of older adults, showing that the main effect is weakened. | Late retirement is shown to help alleviate the physical functioning limitation of older adults. | (-)  Moderated by social health insurance |

Note= PF: Physical Functioning; CVD: Cardiovascular disease; SD: Standard Deviation