**Online Supplemental Material**

**The association of late-life depression with all-cause mortality and cardiovascular mortality among community-dwelling older adults: a systematic review and meta-analysis**

Jingkai Wei,1 Ruixue Hou,2 Xiaotao Zhang,3 Huiwen Xu,4 Liyang Xie,5 Eeshwar K. Chandrasekar,6 Meiling Ying,4 Michael Goodman7

1. Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC
2. Department of Nutrition, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC
3. Department of Epidemiology, Human Genetics and Environmental Sciences, School of Public Health, University of Texas Health Science Center at Houston, Houston, TX
4. Department of Public Health Sciences, School of Medicine and Dentistry, University of Rochester, Rochester, NY
5. Department of Health Services Administration, School of Public Health, University of Maryland, College Park, MD
6. School of Medicine, Emory University, Atlanta, GA
7. Department of Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA

**Appendix**. **Search terms used for the systematic review and meta-analysis**

Pubmed: ((depression ) or (depressive)) and ("mortality"[subheading] OR "mortality"[tw] OR "mortality"[mesh terms] OR "death"[mesh terms] OR "death"[tw] OR "survival"[tw] OR "survival"[mesh terms]) and (older or late-life)

Embase: ('depression'/exp OR depression OR depressive) AND ('mortality'/exp OR mortality OR 'death'/exp OR death OR 'survival'/exp OR survival) AND (older OR 'late life')

Web of Science: (((depression) or (depressive)) and ((mortality) or (death) or (survival)) and ((older) or (late-life)))

PsycINFO: (((depression) or (depressive)) and ((mortality) or (death) or (survival)) and ((older) or (late-life)))

**eTable 1. Characteristics of studies included in the systematic review and meta-analysis**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Sample size | Country | Age, years | Sex, female% | Follow-up, years | Assessment of depression | Prevalence of depression, n (%) | Outcome | Covariates |
| Sun, 2013(1)  Sun, 2011(2) | 62,839  56,088 | China  (Hong Kong)  China  (Hong Kong) | ≥65  (mean<75)  ≥65 | 65.8  66.6 | 8.4  6 | 15-item GDS≥8  15-item GDS≥8 | Overall:  6059 (9.6)  Men:  1514 (7.1)  Women:  4545 (11.0)  Overall:  5439 (9.7)  Men:  1345 (7.2)  Women:  4094 (11.0) | CVD mortality:  Overall: n=3529  Men: n=1428  Women: n=2101  All-cause mortality:  Overall:  1886.9/100,000 person-years  Men:  1509.8/100,000 person-years  Women:  1886.9/100,000 person-years  CVD mortality:  Overall:  519.1/100,000 person-years  Men:  673.2/100,000 person-years  Women:  445.2/100,000 person-years | Age, education, monthly expenditure, smoking, alcohol drinking, physical activity, body mass index, sex, health status and self-rated health  Age, education, monthly expenditure, smoking, alcohol drinking, physical activity, body mass index, health status and self-rated health |
| **Health in Men Study**  Almeida, 2012(3)  Almeida, 2015(4) | 4,805  2,565 | Australia  Australia | 68 to 88  (mean: 76.7)  76 to 94  (mean: 81.8) | 0  0 | 6  4.2 | 15-item GDS≥7  DSM-IV | 297 (5.6)  295 (11.5) | All-cause mortality:  n=883  All-cause mortality:  n=558 | Age, educational attainment, and migrant status. Additional adjustments including current smoking, and the Charlson index  Frailty |
| **Cardiovascular Health Study**  Win, 2011(5)  Schulz, 2000(6) | 5,888  5,201 | USA  USA | ≥65  (mean: 72.8)  65-100  (mean: 72.8) | 58  57 | 10.3  6 | 10-item CES-D≥8  10-item CES-D≥8 | 1252 (21.4)  1036 (20.0) | CVD mortality:  n=1176  All-cause mortality:  N=984 | Age, race, gender, clinic location, education, body mass index, smoking, alcohol, high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, diabetes, hypertension, coronary heart disease, congestive heart failure, stroke and antidepressant medication use.  Sociodemographic factors, prevalent clinical disease, subclinical disease indicators, or biological or behavioral risk factors |
| **Study of Osteoporotic Fractures** Whooley, 1998(7) | 7,518 | USA | ≥67  (mean: 71.4) | 100 | 7 | 15-item GDS≥6 | 473 (6.3) | CVD mortality:  N=325  All-cause mortality:  N=871 | Age, history of myocardial infarction, stroke, diabetes mellitus, hypertension, chronic obstructive pulmonary disease, smoking, perceived health, and cognitive function |
| **Survey of Health and Living Status of the Elderly**  Teng, 2013(8)  Teng, 2013(9) | 1,784  2,416 | China (Taiwan)  China (Taiwan) | ≥65  (mean: 76.8)  ≥65  (mean<75) | 45.2  44.4 | 4  8 | 10-item CES-D≥10  10-item CES-D≥10 | 235 (32.5)  583 (24.1) | CVD mortality:  Not reported  All-cause mortality:  N=382  All-cause mortality:  N=929 | Age, gender, education, marital status, healthy behavior, BMI, chronic diseases, self-rated health and functional impairment.  Age, education, spouse, smoking, alcohol, exercise, BMI, self-rated health + ADL + IADL. |
| Hiltunen, 2014(10) | 508 | Finland | ≥75  (mean: 80.2) | 73.0 | 9 | Zung SDS≥40 | 244 (48.0) | All-cause mortality:  N=266  CVD mortality:  N=146 | Unadjusted |
| **Chicago Health and Aging Project**  Lewis, 2011(11) | 6,158 | USA | ≥65  (mean: 74.8) | 60.6 | 12 | 10-item CES-D≥4 | 991 (16.54) | CVD mortality:  N=925 | Age, sex, education, systolic blood pressure, body mass index, physical activity, smoking, chronic conditions, lipid-lowering drug, CVD medication |
| **The Leiden 85-plus Study** Vinkers, 2004(12) | 500 | Netherlands | ≥85 | 63 | 3.2 | 15-item GDS≥4 | 119 (24) | CVD mortality:  N=306  All-cause mortality:  N=498 | Sex, smoking, alcohol consumption, and number of chronic diseases. |
| **The Health and Retirement Study (HRS)**  Capistrant, 2013(13) | 7,460 | USA | ≥65  (mean: 76.3) | 61.1 | 9.2 | 8-item CES-D≥3 | 1582 (21.2) | CVD mortality:  N=1341 | Age, sex, education, summary score of chronic  conditions, body mass index, smoking and physical activity |
| **Three City**  **Study (3C)**  Ryan, 2008(14) | 7,363 | France | ≥65  (mean: 74) | 60.8 | 4 | Severe:  20-item CES-D≥23  Mild:  20-item CES-D: 16-22 | 1636 (22.2) | All-cause mortality:  N=380 | Center, education, living status, cognitive impairment, high alcohol consumption, regular smoking, disability, recent hospitalization, comorbidity, underweight and obesity. |
| **Established populations for epidemiologic studies of the elderly (EPESE)**  Pinninx, 1998(15) | 3,701 | USA | >70  (mean: 74) | 66.2 | 4 | 20-item CES-D≥20 | 477 (12.9) | All-cause mortality:  N=732  CVD mortality:  N=326 | Age, sex, cigarette smoking, alcohol intake, body mass index, blood pressure, history of stroke, diabetes, or cancer, and physical disability. |
| Ahto, 2007(16) | 660 | Finland | ≥64  (mean: 71.4) | 57.2 | 12 | Zung SDS≥45 | 100 (15.2) | CVD mortality:  N=114 | Age, marital status, social status, number of medicines |
| **The Italian Longitudinal Study on Aging (ILSA)**  Marzari, 2005(17)  Limongi, 2014(18)  Scafato, 2012(19) | 5,632  2,700  3,214 | Italy  Italy  Italy | ≥65  (mean: 73.5)  ≥65  (mean: 72.0)  65-84  (mean: 74.3) | Not reported  55.1  46.7 | 4  6.8  10 | 30-item GDS≥10  30-item GDS≥10  30-item GDS≥10 | 1152 (40.7)  1089 (35.0)  1312 (40.8) | CVD mortality:  N=317  All-cause mortality:  N=868  All-cause mortality:  N=613  All-cause mortality:  N=1209 | Age, diabetes, congestive heart failure, stroke, fibrinogen  Age, gender, education level, marital status, having children, smoking status, myocardial infarction, angina, congestive heart failure, hypertension, stroke, distal symmetrical neuropathy, fibrinogen, disability in activities of daily living and body mass index classification  Age |
| **Singapore Longitudinal Aging Study (SLAS)**  Ho, 2016(20) | 1,070 | Singapore | ≥60  (mean: 65) | 54.7 | 8.5 | Diagnosis according to Geriatric  Mental State Examination | 54 (5.1) | CVD mortality:  Not reported  All-cause mortality:  N=281 | Age, sex, ethnicity, housing status, marital status, current smoking, current daily drinking, low physical activity, cancer, cardiovascular disease including stroke, hypertension, diabetes, chronic pulmonary disease (COPD/asthma), comorbidity, functional disability |
| **Velestino study**  Georgakis,2016(21) | 676 | Greece | ≥60  (mean: 73.7) | 57.0 | 7 | 15-item GDS≥7 | 332 (49.1) | All-cause mortality:  N=201  CVD mortality:  N=128 | Age, sex, education, social activity, family support, body mass index, alcohol intake, hypertension, diabetes, hypercholesterolemia, cardiovascular disease, cancer, cognitive impairment |
| Brown, 2011(22) | 2,728 | USA | ≥60  (mean: 67.5) | 71.4 | 15 | 20-item CES-D≥16 | 423 (15.5) | CVD mortality:  N=269  All-cause mortality:  N=1646 | Age, gender, race, diabetes, hypertension, history of smoking, cholesterol, and ideal body weight |
| **Australian Longitudinal**  **Study of Ageing (ALSA)**  Anstey, 2002(23) | 1,947 | Australia | ≥70  (mean≥75) | 53.4 | 8 | 20-item CES-D≥16 | 290 (15.2) | All-cause mortality:  N=891 | Age, sex, marital status, education, body mass index, smoking, alcohol, medical conditions,  medications |
| Arve, 1998(24) | 1,032 | Finland | 70 | Not reported | 5 | DSM-III | 216 (20.9) | All-cause mortality:  N=311 | Unadjusted |
| **Hispanic EPESE**  Black, 1999(25) | 2,489 | USA | ≥65  (mean≤75) | 56.8 | 2 | 20-item CES-D≥16 | 588 (23.6) | All-cause mortality:  N=224 | Age, sex, education, insurance, immigrant status, self-reported chronic conditions, self-rated health |
| **REasons for Geographic And Racial Differences in Stroke (REGARDS)** Bowling, 2013(26) | 11,400 | USA | ≥65  (mean: 72.7) | 57.3 | 2 | 4-item CES-D≥4 | 2723 (11.5) | All-cause mortality:  Not reported | Age, race, sex, education, region of residence, income, current cigarette smoking, atrial fibrillation, coronary heart disease, stroke, diabetes mellitus, estimated glomerular filtration rate, albuminuria, systolic and diastolic blood pressure, waist circumference, high-density lipoprotein cholesterol, total cholesterol, and C-reactive protein |
| Davidson, 1988(27) | 1,054 | UK | ≥65  (mean not reported) | 61.0 | 3 | AGECAT | 118 (11.0) | All-cause mortality:  N=179 | Unadjusted |
| Cuijpers, 1999(28) | 424 | Netherlands | ≥63  (mean ≥75) | 78.5 | 1 | 15-item GDS≥11 | 113 (26.7) | All-cause mortality:  N=69 | Demographic variables and correlates of depression |
| Enzell, 1984(29) | 6,663 | Sweden | 66 | 59.1 | 4 | Interview | 407 (6.1) | All-cause mortality:  N=477 | Unadjusted |
| Engedal, 1996(30) | 334 | Norway | ≥75 | 76.6 | 3 | Diagnosed according to DSM-III | 53 (15.9) | All-cause mortality:  N=53 | Unadjusted |
| **The Bambuí Cohort Study of Aging (BCSA)** Diniz, 2014(31) | 1,508 | Brazil | ≥60  (mean: 69.0) | 61.1 | 10 | GHQ-12≥5 | 581 (38.5) | All-cause mortality:  N=441 | Gender, baseline age, baseline monthly income, marital status, use of psychoactive drugs, retirement, educational level, activities of daily living, MMSE scores, drinking and smoking habits, hypertension, myocardial infarct, Chagas disease, physical activity, BMI, diabetes mellitus 2 |
| Fredman, 1999(32) | 764 | USA | ≥65  (mean: 73.3) | 100 | 6 | 20-item CES-D≥16 | 98 (12.8) | All-cause mortality:  N=174 | Age |
| **ECA-Piedmont Health Survey** Fredman, 1989(33) | 1,606 | USA | ≥60  (mean: 70) | 65.1 | 2 | Diagnosed according to DSM-III (level 3 or above) | 80 (5.0) | All-cause mortality:  N=92 | Age, activities of daily living, sex, cognitive impairment |
| Fu, 2003(34) | 281 | China (Taiwan) | ≥65  (mean: 73.1) | 43.9 | 12 | 20-item CES-D≥15 | 153 (54.6) | All-cause mortality:  N=94 | Age |
| **Personnes Agées QUID (PAQUID)** Fuhrer, 1999(35) | 3,777 | France | ≥65 | 58.3 | 5 | Men:  20-item CES-D≥17  Women:  20-item CES-D≥23 | 527 (14.0) | All-cause mortality:  N=849 | Age, education, health (Instrumental Activities of Daily Living, cognitive function (Mini-Mental State Examination), hospitalization in preceding year), and health behavior (smoking habits and alcohol consumption) |
| **National Diet and Nutrition Survey**  Hamer, 2011(36) | 1,007 | UK | ≥65  (mean: 76.4) | 48.2 | 9.2 | 15-item GDS≥5 | 210 (20.9) | All-cause mortality:  N=522 | Age, sex, education, medication, smoking, physical activity, grip strength |
| **The Concord Health and Ageing in Men Project (CHAMP)**  Hirani, 2014(37) | 1,508 | Australia | ≥70  (mean: 77) | 0 | 6.7 | 15-item GDS≥5 | 198 (28.9) | All-cause mortality:  N=461 | Age, smoking status, BMI, alcohol consumption, myocardial infarction, congestive heart failure, cancer, depressive symptoms, IADL disability, ADL disability, chair stands, white blood cell count, hemoglobin albumin |
| **The Amsterdam Study of the Elderly (AMSTEL)** Holwerda, 2007(38)  Schoevers, 2000(39)  Schoevers, 2009(40) | 4,051  4,051  3,746 | Netherlands  Netherlands  Netherlands | ≥65  (mean: ≥75)  65-84  65-84 | 62.4  62.4  62.0 | 10  6  10 | AGECAT level 3 or higher  AGECAT level 3 or higher  AGECAT level 3 or higher | 455 (12.1)  523 (12.9)  713 (12.8) | All-cause mortality:  N=2095  All-cause mortality:  N=1035  All-cause mortality:  N=1844 | Age, education, myocardial infarction, stroke, other diseases, MMSE, ADL, IADL disability, marital status, social support  Age, education, marital status, myocardial infarction, stroke, other diseases, MMSE, ADL, IADL disability  Unadjusted |
| **Korean Longitudinal Study on Health and Aging (KLoSHA)**  Jeong, 2013(41) | 1,000 | Korea | ≥65  (mean: 76.3) | 56.1 | 5 | Diagnosed according to DSM-IV | 186 (18.6) | All-cause mortality:  N=174 | Age, education level, cognitive function, alcohol use, and smoking |
| Jorm, 1991(42) | 228 | Australia | ≥70  (mean: 79.0) | Not reported | 5 | Diagnosed according to DSM-III | 169 (61.7) | All-cause mortality:  N=94 | Unadjusted |
| Kawamura, 2007(43) | 920 | Japan | ≥65  (mean: 77.4) | 59.9 | 15 | SDS≥60%, or NSDS≥60 | 158 (17.2) | All-cause mortality:  N=461 | Age |
| **The Washington Heights-Inwood Columbia Aging Project (WHICAP)**  Lara, 2016(44) | 1,958 | USA | ≥65  (mean: 76.8) | 67.2 | 15 | 10-item CES-D≥4 | 97 (5.0) | All-cause mortality  N=976 | Age, gender, education, ethnicity, smoking status, alcohol consumption, APOE4 (only in the AD samples), diabetes mellitus, hypertension, stroke, heart disease and, prevalent AD and an interaction term between depression and prevalent AD (only in the total sample). |
| Meller, 1999(45) | 441 | Germany | ≥85 |  | 4.7 | Diagnosed according to AGECAT, Hamilton depression scale and SIDAM scale | Not reported | All-cause mortality  N=256 | Age |
| **The Health, Aging and Body Composition Study (Health ABC)**  Murphy, 2016(46) | 2,102 | USA | 70-79  (mean: 73.5) | 50.9 | 14 | 10-item CES-D≥8 | 148 (7.0) | All-cause mortality  N=809 | Age, race, education, study site, body mass index, diabetes, cardiovascular disease, cancer, arthritis, asthma, smoking status, alcohol consumption, physical activity, wealth, income, prevalent diabetes, cardiovascular disease cancer, arthritis, and asthma |
| **Living Profiles of Older People Survey**  Park, 2018(47) | 14,976 | Korea | ≥60  (mean: 69.8) | 57.4 | 3 | 15-item GDS≥8 | Not reported | All-cause mortality  N=828 | Age, sex, body mass index, income, education, smoking, alcohol consumption, nutritional risk score, comorbidities, frailty and the Korean version of activities of daily living. |
| **Berlin Aging Study (BASE)**  Rapp, 2008(48) | 497 | Germany | 70-84 | 50.3 | 15 | Diagnosed according to DSM-III | 128 (25.8) | All-cause mortality  N=414 | Age, gender, education, dementia, cardiovascular disease, all diseases |
| **Zaragoza study** Saz, 1999(49) | 1,080 | Spain | ≥65  (mean: ≤75) | 53.1 | 4.5 | AGECAT≥3 | 105 (10.6) | All-cause mortality  N=214 | Unadjusted |
| **Manitoba Study of Health and Aging (MSHA)**  St John, 2012(50) | 1,751 | Canada | ≥65  (mean: 76.2) | 58.5 | 5 | 20-item CES-D≥16 | 240 (13.8) | All-cause mortality  N=417 | Age, sex, education, Modified Mini-Mental State Examination score, Older American Resource Survey, self-rated health |
| Thomas, 1992(51) | 1,855 | USA | ≥65  (mean: 74.4) | >50 | 3 | 20-item CES-D≥16 | 351 (22.3) | All-cause mortality  N=108 | Age, sex, health condition |
| Unützer, 2002(52) | 2,558 | USA | ≥65  (mean: 73) | 61 | 7 | 20-item CES-D≥16 | 359 (14.0) | All-cause mortality  N=460 | Age, sex, education, marital status, excessive alcohol use, smoking, nutrition, exercise, body mass index, chronic diseases |
| **Cambridge Examination for Mental Disorders**  **of the Elderly (CAMDEX)** Vilalta-Franch, 2011(53) | 451 | Spain | ≥65  (mean: 76.8) | 64.4 | 5 | Diagnosed according to DSM-IV | 107 (25.2) | All-cause mortality  N=80 | Unadjusted |
| **Japan Gerontological Evaluation Study**  Aida, 2017(54) | 860 | Japan | ≥65  (mean: 75.6) | 59.8 | 3.2 | 15-item GDS≥5 | 256 (31.0) | All-cause mortality  N=128 | Unadjusted |
| Hornsten, 2013(55) | 452 | Sweden and Finland | ≥85 | 68.8 | 5 | 15-item GDS≥5 | 129 (28.5) | All-cause mortality  N=260 | Unadjusted |
| Pulska, 1998(56) | 882 | Finland | ≥65  (mean: 74.3) | 60.2 | 6 | Diagnosed according to DSM-III | 29 (3.3) | All-cause mortality  N=242 | Sex, age, smoking, physical health, functional abilities |
| Rozzini, 2003(57) | 524 | Italy | ≥70  (mean: 76.6) | 67.0 | 5 | 15-item GDS>5 | 138 (26.3) | All-cause mortality  N=131 | Age, gender, education, and number of diseases/chronic conditions |
| **The Monongahela**  **Valley Independent Elders Survey (MoVIES) Project**  Ganguli, 2002(58) | 1,064 | USA | ≥67  (mean: 74.9) | 57.5 | 10 | mCES-D≥5 symptoms | 109 (10.2) | All-cause mortality  N=482 | Age, sex, education, cognitive function, functional disability, self-rated health, number of prescription drugs taken |
| **PROSPECT** Gallo, 2005(59) | 1,226 | USA | ≥60  (mean: 71) | 70 | 2 | DSM-IV | 598 (48.9) | All-cause mortality  N=64 | MI and diabetes at baseline |
| **MELSHA**  Atlantis, 2011(60) | 1,000 | Australia | ≥65 | 53 | 12 | PAS≥5 or using antidepressants | 110 (11.0) | All-cause mortality  Not reported | Demographic, lifestyle, functional health and chronic disease predictors |
| **New Haven EPESE**  Mendes de Leon, 1998(61) | 2,391 | USA | ≥65 | 65.7 | 9 | 20-item CES-D≥21 | 201 (8.4) | CHD mortality:  N=255 | Age |



(A)



(B)

**eFigure 1**. **Funnel plots of included studies of late-life depression and risk of (A) all-cause mortality and (B) cardiovascular mortality.**

**eTable 2**. Quality assessment of the 66 cohort studies included in the meta-analysis according to the Newcastle-Ottawa Scale

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Selection | | | | Comparability | Outcome | | | Total |
|  | Exposed  Cohort  Representative | Selection of  Non-Exposed Cohort | Ascertainment  of Exposure | Outcome not Present at Baseline | Analysis Adjusted  for Confounding Factors | Assessment of Outcome | Length  of Follow-up | Adequacy of  Follow-up |
| Sun, 2013(1) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Sun, 2011(2) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Almeida, 2012(3) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Almeida, 2015(4) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Win, 2011(5) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Schulz, 2000(6) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Whooley, 1998(7) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Teng, 2013(8) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Teng, 2013(9) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Hiltunen, 2014(10) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Lewis, 2011(11) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Vinkers, 2004(12) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Capistrant, 2013(13) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Ryan, 2008(14) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 9 |
| Pinninx, 1998(15) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Ahto, 2007(16) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Marzari, 2005(17) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Limongi, 2014(18) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Scafato, 2012(19) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Ho, 2016(20) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Georgakis,2016(21) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Brown, 2011(22) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Anstey, 2002(23) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Arve, 1998(24) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 7 |
| Black, 1999(25) | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 0 | 6 |
| Bowling, 2013(26) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Davidson, 1988(27) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| Cuijpers, 1999(28) | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 5 |
| Enzell, 1984(29) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 7 |
| Engedal, 1996(30) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 7 |
| Diniz, 2014(31) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Fredman, 1999(32) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Fredman, 1989(33) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 6 |
| Fu, 2003(34) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Fuhrer, 1999(35) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Hamer, 2011(36) | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 0 | 6 |
| Hirani, 2014(37) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Holwerda, 2007(38) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Schoevers, 2000(39) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 9 |
| Schoevers, 2009(40) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Jeong, 2013(41) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 7 |
| Jorm, 1991(42) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 6 |
| Kawamura, 2007(43) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 6 |
| Lara, 2016(44) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 8 |
| Meller, 1999(45) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Murphy, 2016(46) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Park, 2018(47) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Rapp, 2008(48) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Saz, 1999(49) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| St John, 2012(50) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 6 |
| Thomas, 1992(51) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Unützer, 2002(52) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Vilalta-Franch, 2011(53) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Aida, 2017(54) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Hornsten, 2013(55) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 6 |
| Pulska, 1998(56) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 6 |
| Rozzini, 2003(57) | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 5 |
| Ganguli, 2002(58) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Gallo, 2005(59) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 8 |
| Atlantis, 2011(60) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |
| Mendes de Leon, 1998(61) | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 7 |

**REFERENCES**

1. Sun WJ, Xu L, Chan WM, Lam TH, Schooling CM. Are depressive symptoms associated with cardiovascular mortality among older Chinese: a cohort study of 64,000 people in Hong Kong? The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry. 2013; 21(11): 1107-15.

2. Sun W, Schooling CM, Chan WM, Ho KS, Lam TH. The association between depressive symptoms and mortality among Chinese elderly: a Hong Kong cohort study. The journals of gerontology Series A, Biological sciences and medical sciences. 2011; 66(4): 459-66.

3. Almeida OP, Alfonso H, Hankey GJ, Flicker L. Depression, antidepressant use and mortality in later life: the Health In Men Study. PloS one. 2010; 5(6): e11266.

4. Almeida OP, Hankey GJ, Yeap BB, Golledge J, Norman PE, Flicker L. Depression, frailty, and all-cause mortality: a cohort study of men older than 75 years. Journal of the American Medical Directors Association. 2015; 16(4): 296-300.

5. Win S, Parakh K, Eze-Nliam CM, Gottdiener JS, Kop WJ, Ziegelstein RC. Depressive symptoms, physical inactivity and risk of cardiovascular mortality in older adults: the Cardiovascular Health Study. Heart (British Cardiac Society). 2011; 97(6): 500-5.

6. Schulz R, Beach SR, Ives DG, Martire LM, Ariyo AA, Kop WJ. Association between depression and mortality in older adults: the Cardiovascular Health Study. Archives of internal medicine. 2000; 160(12): 1761-8.

7. Whooley MA, Browner WS. Association between depressive symptoms and mortality in older women. Study of Osteoporotic Fractures Research Group. Archives of internal medicine. 1998; 158(19): 2129-35.

8. Teng PR, Yeh CJ, Lee MC, Lin HS, Lai TJ. Change in depressive status and mortality in elderly persons: results of a national longitudinal study. Archives of gerontology and geriatrics. 2013; 56(1): 244-9.

9. Teng PR, Yeh CJ, Lee MC, Lin HS, Lai TJ. Depressive symptoms as an independent risk factor for mortality in elderly persons: results of a national longitudinal study. Aging & mental health. 2013; 17(4): 470-8.

10. Hiltunen M, Nieminen T, Kettunen R, Hartikainen S, Sulkava R, Vuolteenaho O, et al. Depressive symptoms and cardiovascular burden-related mortality among the aged. European journal of clinical investigation. 2014; 44(5): 486-92.

11. Lewis TT, Guo H, Lunos S, Mendes de Leon CF, Skarupski KA, Evans DA, et al. Depressive symptoms and cardiovascular mortality in older black and white adults: evidence for a differential association by race. Circulation Cardiovascular quality and outcomes. 2011; 4(3): 293-9.

12. Vinkers DJ, Stek ML, Gussekloo J, van der Mast RC, Westendorp RGJ. Does depression in old age increase only cardiovascular mortality? The Leiden 85-plus study. International journal of geriatric psychiatry. 2004; 19(9): 852-7.

13. Capistrant BD, Gilsanz P, Moon JR, Kosheleva A, Patton KK, Glymour MM. DOES THE ASSOCIATION BETWEEN DEPRESSIVE SYMPTOMS AND CARDIOVASCULAR MORTALITY RISK VARY BY RACE? EVIDENCE FROM THE HEALTH AND RETIREMENT STUDY. Ethnicity & disease. 2013; 23(2): 155-60.

14. Ryan J, Carriere I, Ritchie K, Stewart R, Toulemonde G, Dartigues JF, et al. Late-life depression and mortality: influence of gender and antidepressant use. The British journal of psychiatry : the journal of mental science. 2008; 192(1): 12-8.

15. Penninx BW, Guralnik JM, Mendes de Leon CF, Pahor M, Visser M, Corti MC, et al. Cardiovascular events and mortality in newly and chronically depressed persons > 70 years of age. The American journal of cardiology. 1998; 81(8): 988-94.

16. Ahto M, Isoaho R, Puolijoki H, Vahlberg T, Kivela SL. Stronger symptoms of depression predict high coronary heart disease mortality in older men and women. International journal of geriatric psychiatry. 2007; 22(8): 757-63.

17. Marzari C, Maggi S, Manzato E, Destro C, Noale M, Bianchi D, et al. Depressive symptoms and development of coronary heart disease events: the Italian longitudinal study on aging. The journals of gerontology Series A, Biological sciences and medical sciences. 2005; 60(1): 85-92.

18. Limongi F, Noale M, Crepaldi G, Maggi S. Prevalence of diabetes and depressive symptomatology and their effect on mortality risk in elderly Italians: The Italian Longitudinal Study on Aging. Diabetes & metabolism. 2014; 40(5): 373-8.

19. Scafato E, Galluzzo L, Ghirini S, Gandin C, Rossi A, Solfrizzi V, et al. Changes in severity of depressive symptoms and mortality: the Italian Longitudinal Study on Aging. Psychological medicine. 2012; 42(12): 2619-29.

20. Ho C, Jin A, Nyunt MS, Feng L, Ng TP. Mortality rates in major and subthreshold depression: 10-year follow-up of a Singaporean population cohort of older adults. Postgraduate medicine. 2016; 128(7): 642-7.

21. Georgakis MK, Papadopoulos FC, Protogerou AD, Pagonari I, Sarigianni F, Biniaris-Georgallis SI, et al. Comorbidity of Cognitive Impairment and Late-Life Depression Increase Mortality: Results From a Cohort of Community-Dwelling Elderly Individuals in Rural Greece. Journal of geriatric psychiatry and neurology. 2016; 29(4): 195-204.

22. Brown JM, Stewart JC, Stump TE, Callahan CM. Risk of coronary heart disease events over 15 years among older adults with depressive symptoms. The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry. 2011; 19(8): 721-9.

23. Anstey KJ, Luszcz MA. Mortality risk varies according to gender and change in depressive status in very old adults. Psychosomatic medicine. 2002; 64(6): 880-8.

24. Arve S, Lehtonen A, Tilvis RS. Prognosis of depression with and without dementia in old age. Archives of gerontology and geriatrics. 1998; 27(2): 141-6.

25. Black SA, Markides KS. Depressive symptoms and mortality in older Mexican Americans. Annals of epidemiology. 1999; 9(1): 45-52.

26. Bowling CB, Booth JN, 3rd, Safford MM, Whitson HE, Ritchie CS, Wadley VG, et al. Nondisease-specific problems and all-cause mortality in the REasons for Geographic and Racial Differences in Stroke study. Journal of the American Geriatrics Society. 2013; 61(5): 739-46.

27. Davidson IA, Dewey ME, Copeland JR. The relationship between mortality and mental disorder: Evidence from the Liverpool longitudinal study. International journal of geriatric psychiatry. 1988; 3(2): 95-8.

28. Cuijpers P. Mortality and depressive symptoms in inhabitants of residential homes. International journal of geriatric psychiatry. 2001; 16(2): 131-8.

29. Enzell K. Mortality among persons with depressive symptoms and among responders and non-responders in a health check-up. An investigation of persons born in 1905 and followed up from age 66 to 75. Acta psychiatrica Scandinavica. 1984; 69(2): 89-102.

30. Engedal K. Mortality in the elderly: A 3-year follow-up of an elderly community sample. International journal of geriatric psychiatry. 1996; 11(5): 467-71.

31. Diniz BS, Reynolds CF, 3rd, Butters MA, Dew MA, Firmo JO, Lima-Costa MF, et al. The effect of gender, age, and symptom severity in late-life depression on the risk of all-cause mortality: the Bambui Cohort Study of Aging. Depression and anxiety. 2014; 31(9): 787-95.

32. Fredman L, Magaziner J, Hebel JR, Hawkes W, Zimmerman SI. Depressive symptoms and 6-year mortality among elderly community-dwelling women. Epidemiology (Cambridge, Mass). 1999; 10(1): 54-9.

33. Fredman L, Schoenbach VJ, Kaplan BH, Blazer DG, James SA, Kleinbaum DG, et al. The association between depressive symptoms and mortality among older participants in the Epidemiologic Catchment Area-Piedmont Health Survey. Journal of gerontology. 1989; 44(4): S149-56.

34. Fu CC, Lee YM, Chen JD. Association between depressive symptoms and twelve-year mortality among elderly in a rural community in Taiwan. Journal of the Formosan Medical Association = Taiwan yi zhi. 2003; 102(4): 234-9.

35. Fuhrer R, Dufouil C, Antonucci TC, Shipley MJ, Helmer C, Dartigues JF. Psychological disorder and mortality in French older adults: do social relations modify the association? American journal of epidemiology. 1999; 149(2): 116-26.

36. Hamer M, Bates CJ, Mishra GD. Depression, physical function, and risk of mortality: National Diet and Nutrition Survey in adults older than 65 years. The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry. 2011; 19(1): 72-8.

37. Hirani V, Naganathan V, Blyth F, Le Couteur DG, Gnjidic D, Stanaway FF, et al. Multiple, but not traditional risk factors predict mortality in older people: the Concord Health and Ageing in Men Project. Age (Dordrecht, Netherlands). 2014; 36(6): 9732.

38. Holwerda TJ, Schoevers RA, Dekker J, Deeg DJ, Jonker C, Beekman AT. The relationship between generalized anxiety disorder, depression and mortality in old age. International journal of geriatric psychiatry. 2007; 22(3): 241-9.

39. Schoevers RA, Geerlings MI, Beekman AT, Penninx BW, Deeg DJ, Jonker C, et al. Association of depression and gender with mortality in old age. Results from the Amsterdam Study of the Elderly (AMSTEL). The British journal of psychiatry : the journal of mental science. 2000; 177: 336-42.

40. Schoevers RA, Geerlings MI, Deeg DJ, Holwerda TJ, Jonker C, Beekman AT. Depression and excess mortality: evidence for a dose response relation in community living elderly. International journal of geriatric psychiatry. 2009; 24(2): 169-76.

41. Jeong HG, Lee JJ, Lee SB, Park JH, Huh Y, Han JW, et al. Role of severity and gender in the association between late-life depression and all-cause mortality. International psychogeriatrics. 2013; 25(4): 677-84.

42. Jorm AF, Henderson AS, Kay DW, Jacomb PA. Mortality in relation to dementia, depression and social integration in an elderly community sample. International journal of geriatric psychiatry. 1991; 6(1): 5-11.

43. Kawamura T, Shioiri T, Takahashi K, Ozdemir V, Someya T. Survival rate and causes of mortality in the elderly with depression: a 15-year prospective study of a Japanese community sample, the Matsunoyama-Niigata suicide prevention project. Journal of investigative medicine : the official publication of the American Federation for Clinical Research. 2007; 55(3): 106-14.

44. Lara E, Haro JM, Tang MX, Manly J, Stern Y. Exploring the excess mortality due to depressive symptoms in a community-based sample: The role of Alzheimer's Disease. Journal of affective disorders. 2016; 202: 163-70.

45. Meller I, Fichter MM, Schröppel H. Mortality risk in the octo- and nonagenerians: Longitudinal results of an epidemiological follow-up community study. European archives of psychiatry and clinical neuroscience. 1999; 249(4): 180-9.

46. Murphy RA, Hagaman AK, Reinders I, Steeves JA, Newman AB, Rubin SM, et al. Depressive Trajectories and Risk of Disability and Mortality in Older Adults: Longitudinal Findings From the Health, Aging, and Body Composition Study. The journals of gerontology Series A, Biological sciences and medical sciences. 2016; 71(2): 228-35.

47. Park SH, Kim D, Cho J, Jin Y, Lee I, Lee K, et al. Depressive symptoms and all-cause mortality in Korean older adults: A 3-year population-based prospective study. Geriatrics & gerontology international. 2018.

48. Rapp MA, Gerstorf D, Helmchen H, Smith J. Depression predicts mortality in the young old, but not in the oldest old: Results from the Berlin Aging study. American Journal of Geriatric Psychiatry. 2008; 16(10): 844-52.

49. Saz P, Launer LJ, Dia JL, De-la-Camara C, Marcos G, Lobo A. Mortality and mental disorders in a Spanish elderly population. International journal of geriatric psychiatry. 1999; 14(12): 1031-8.

50. St John P, Montgomery P. Does self-rated health predict death in older adults with depressive symptoms? Canadian journal on aging = La revue canadienne du vieillissement. 2012; 31(1): 49-54.

51. Thomas C, Kelman HR, Kennedy GJ, Ahn C, Yang CY. Depressive symptoms and mortality in elderly persons. Journal of gerontology. 1992; 47(2): S80-7.

52. Unutzer J, Patrick DL, Marmon T, Simon GE, Katon WJ. Depressive symptoms and mortality in a prospective study of 2,558 older adults. The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry. 2002; 10(5): 521-30.

53. Vilalta-Franch J, Planas-Pujol X, López-Pousa S, Llinàs-Reglà J, Merino-Aguado J, Garre-Olmo J. Depression subtypes and 5-years risk of mortality in aged 70 years: A population-based cohort study. International journal of geriatric psychiatry. 2012; 27(1): 67-75.

54. Aida J, Hikichi H, Matsuyama Y, Sato Y, Tsuboya T, Tabuchi T, et al. Risk of mortality during and after the 2011 Great East Japan Earthquake and Tsunami among older coastal residents. Scientific reports. 2017; 7(1): 16591.

55. Hornsten C, Lovheim H, Gustafson Y. The Association Between Stroke, Depression, and 5-Year Mortality Among Very Old People. Stroke. 2013; 44(9): 2587-9.

56. Pulska T, Pahkala K, Laippalla P, Kivela SL. Major depression as a predictor of premature deaths in elderly people in Finland: a community study. Acta psychiatrica Scandinavica. 1998; 97(6): 408-11.

57. Rozzini R, Sabatini T, Frisoni GB, Trabucchi M. Cognitive Impairment Modulates the Effect of Depressive Symptoms on Mortality in Elderly People. The Journals of Gerontology: Series A: Biological Sciences and Medical Sciences. 2003; 58(12): 1145-6.

58. Ganguli M, Dodge HH, Mulsant BH. Rates and predictors of mortality in an aging, rural, community-based cohort: the role of depression. Archives of general psychiatry. 2002; 59(11): 1046-52.

59. Gallo JJ, Bogner HR, Morales KH, Post EP, Ten Have T, Bruce ML. Depression, cardiovascular disease, diabetes, and two-year mortality among older, primary-care patients. The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry. 2005; 13(9): 748-55.

60. Atlantis E, Grayson DA, Browning C, Sims J, Kendig H. Cardiovascular disease and death associated with depression and antidepressants in the Melbourne Longitudinal Studies on Healthy Ageing (MELSHA). International journal of geriatric psychiatry. 2011; 26(4): 341-50.

61. Mendes de Leon CF, Krumholz HM, Seeman TS, Vaccarino V, Williams CS, Kasl SV, et al. Depression and risk of coronary heart disease in elderly men and women: New Haven EPESE, 1982-1991. Established Populations for the Epidemiologic Studies of the Elderly. Archives of internal medicine. 1998; 158(21): 2341-8.