**Chronic diseases and objectively monitored physical activity profile among aged individuals – a cross-sectional twin cohort study**

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**Supplentary files:**

**Supplementary Table I. Distribution of physical activity and sedentary behavior variables in the target cohort of 779 participants (293 men and 305 women).**

**Supplementary Table II. Self-reported physician-diagnosed diseases by reporting any disease restricting mobility.**

**Supplementary Table III. Daily moderate-to-vigorous physical activity according to self-reported disease.**

**Supplementary Table IV. Daily steps according to self-reported disease.**

**Supplementary Table V. Moderate-to vigorous physical activity and daily steps according to the number of self-reported diseases and sex.**

**Supplementary Table VI. Daily physical activity/inactivity characteristics according to self-reported physician-diagnosed diseases restricting mobility and other physician diagnosed diseases and sex.**

**Supplementary Table VII. Median of the mid-life mean MET-index from self-reported leisure-time physical activity in 1975, 1981 and 1990\* according to self-reported physician-diagnosed diseases restricting mobility at follow-up and sex.**

**Supplementary Table I. Distribution of physical activity and sedentary behavior variables in the target cohort of 779 participants (293 men and 305 women).**

|  |  |
| --- | --- |
| **Activity/inactivity variable** | **Median (IQR from 25% to 75%)** |
| **Sedentary time (lying and sitting)/day, min** | |
| All | 532 (466 to 595) |
| Men | 540 (474 to 598) |
| Women | 526 (454 to 583) |
| **Standing time/day, min** | |
| All | 82 (57 to 113) |
| Men | 78 (57 to 107) |
| Women | 86 (57 to 119) |
| **Time of light physical activity/day, min** | |
| All | 171 (133 to 214) |
| Men | 172 (130 to 214) |
| Women | 169 (134 to 211) |
| **Time of moderate-to-vigorous physical activity/day, min** | |
| All | 35 (18 to 56) |
| Men | 38 (21 to 63) |
| Women | 31 (17 to 50) |
| **Daily step count, number of steps** | |
| All | 5958 (4056 to 8516) |
| Men | 6376 (4513 to 8754) |
| Women | 5560 (3713 to 8261) |
| **Peak-10min MET, MET** | |
| All | 3.46 (2.93 to 4.14) |
| Men | 3.51 (2.99 to 4.20) |
| Women | 3.43 (2.91 to 4.05) |

\*All analyses with bootstrapping (1000 repetitions). Activity variables calculated based on one minute exponential moving average.

**Supplementary Table II. Self-reported physician-diagnosed diseases by reporting any disease restricting mobility.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Disease** | **% (n) individuals reporting the physician diagnosed disease** | | |  |
|  | **All participants** | **Reported the specific disease including in the cardio-metabolic or arthritis disease cluster\*** | | |
|  |  | **Did not self-report a disease restricting mobility** | **Self-reported a disease restricting mobility** | ***P* value†** |
| **Hypertension** | 47.8 (369 of 772; ND 7) | 44.0 (261) | 60.3 (108) | .001 |
| **Coronary heart disease/MI** | 12.1 (93 of 769; ND 10) | 8.8 (52) | 23.2 (41) | <.001 |
| **Heart failure** | 6.6 (51 of 767; ND 12) | 4.4 (26) | 14.2 (25) | <.001 |
| **Atrial fibrillation** | 9.5 (73 of 769; ND 10) | 7.3 (43) | 16.9 (30) | .001 |
| **Diabetes** | 14.0 (108 of 772; ND 7) | 11.8 (70) | 21.2 (38) | .001 |
| **Rheumatoid arthritis** | 4.7 (37 of 779;ND 0) | 2.7 (16) | 11.6 (21) | <.001 |
| **Knee osteoarthritis** | 20.5 (160 of 779; ND 0) | 14.4 (86) | 40.9 (74) | <.001 |
| **Hip osteoarthritis** | 7.6 (59 of 779; ND 0) | 4.5 (27) | 17.7 (32) | <.001 |

ND; not defined (either unclear status or no response)

\*Cardio-metabolic or arthritis disease cluster included hypertension, coronary heart disease/myocardial infarction, heart failure, atrial fibrillation, diabetes, rheumatoid arthritis, knee osteoarthritis, hip osteoarthritis.

†By ꭙ2 test.

**Supplementary Table III. Daily moderate-to-vigorous physical activity according to self-reported disease.\***

|  |  |  |  |
| --- | --- | --- | --- |
| **Disease** | **Moderate to vigorous physical activity, min** | |  |
|  | **Without the disease** | **With the disease** |  |
|  | **n**  **Median**  **(95% CI of median)** | | ***P* value†** |
| **Hypertension** | 403  39  (35 to 44) | 369  29  (26 to 33) | <.0001 |
| **Coronary heart disease/MI** | 676  36  (34 to 38) | 93  25  (18 to 32) | <.0001 |
| **Heart failure** | 716  36  (34 to 38) | 51  18  (11 to 27) | <.0001 |
| **Atrial fibrillation** | 696  36  (34 to 38) | 73  25  (18 to 30) | <.0001 |
| **Diabetes** | 664  36  (34 to 38) | 108  25  (15 to 35) | <.0001 |
| **Rheumatoid arthritis** | 742  36  (33 to 37) | 37  16  (11 to 27) | <.0001 |
| **Knee osteoarthritis** | 619  37  (34 to 39) | 160  25  (21 to 29) | <.0001 |
| **Hip osteoarthritis** | 720  35  (33 to 37) | 59  24  (17 to 35) | .001 |

\*All analyses with bootstrapping (1000 samples unless otherwise noted). Activity variable calculated based on one minute exponential moving average

†*P* values for the difference between those with the disease and those without from linear regression analysis adjusted for sex, age and cluster for family.

**Supplementary Table IV. Daily steps according to self-reported disease.\***

|  |  |  |  |
| --- | --- | --- | --- |
| **Disease** | **N of steps** | |  |
|  | **Without the disease** | **With the disease** |  |
|  | **n**  **Median**  **(95% CI of median)** | | ***P* value†** |
| **Hypertension** | 403  6657  (6275 to 7148) | 369  5186  (4857 to 5573) | <.0001 |
| **Coronary heart disease/MI** | 676  6180  (5890 to 6440) | 93  4346  (3805 to 5050) | <.0001 |
| **Heart failure** | 716  6096  (5821 to 6374) | 51  4008  (3233 to 4746) | <.0001 |
| **Atrial fibrillation** | 696  6036  (5758 to 6272) | 73  4818  (4285 to 6231) | .002 |
| **Diabetes** | 403  6657  (6275 to 7148) | 108  4827  (3988 to 5576) | <.0001 |
| **Rheumatoid arthritis** | 742  6039  (5758 to 6272) | 37  3976  (2911 to 5760) | .004 |
| **Knee osteoarthritis** | 619  6156  (5869 to 6453) | 160  5329  (4440 to 5767) | .005 |
| **Hip osteoarthritis** | 720  6029  (5759 to 6248) | 59  4739  (3633 to 6334) | .017 |

\*All analyses with bootstrapping (1000 samples unless otherwise noted). Activity variable calculated based on one minute exponential moving average

†*P* values for the difference between those with the disease and those without from linear regression analysis adjusted for sex, age and cluster for family.

**Supplementary Table V. Moderate-to vigorous physical activity and daily steps according to the number of self-reported diseases and sex.\***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activity variable** | **Disease status†** | | | |
|  | **No reported disease** | **1 reported disease** | **2 reported diseases** | **3 or more reported diseases** |
|  | **N of persons in each cell** | | | |
| All  Men  Women | n = 259  n = 122  n = 137 | n = 246  n = 110  n = 136 | n = 171  n = 89  n = 82 | n = 103  n = 57  n = 46 |
|  | **Median**  **(95% CI)** | | | |
| **Moderate-to-vigorous physical activity, min** | | | | |
| All | 43  (38 to 48) | 37  (31 to 39) | 30  (27 to 37) | 15  (11 to 22) |
| Men | 48  (40 to 56) | 42  (36 to 44) | 37  (30 to 48) | 17  (11 to 24) |
| Women | 39  (34 to 44) | 31  (26 to 37) | 27  (24 to 32) | 13  (7 to 25) |
| **Steps** | | | | |
| All | 6975  (6431 to 7815) | 6114  (5700 to 6610) | 5475  (4979 to 5799) | 3765  (3311 to 4405) |
| Men | 7903  (6944 to 8439) | 6236  (6058 to 6788) | 5728  (5054 to 6544) | 4056  (3544 to 4777) |
| Women | 6236  (5847 to 7136) | 5450  (4858 to 6656) | 5374  (4795 to 5740) | 3215  (2568 to 4405) |

\*All analyses with bootstrapping (1000 repetitions).

†Number of self-reported cardio-metabolic or arthritis disease cluster diseases (reported hypertension, coronary heart disease/myocardial infarction, heart failure, atrial fibrillation, diabetes, rheumatoid arthritis, knee osteoarthritis or hip osteoarthritis ignoring the reporting of mobility restricting disease).

**Supplementary Table VI. Daily physical activity/inactivity characteristics according to self-reported physician-diagnosed diseases restricting mobility and other physician diagnosed diseases and sex.\***

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity variable** | **Disease status** | | |
|  | **No reported disease** | **Other reported disease†** | **Reported disease restricting mobility** |
|  | **N of persons in each cell** | | |
| All  Men  Women | n = 240  n = 115  n = 125 | n = 358  n = 178  n = 180 | n = 181  n = 85  n = 96 |
|  | **Median**  **(95% CI)** | | |
| **Sedentary time, min** | | | |
| All | 503  (482 to 519) | 536  (524 to 548) | 558  (545 to 574) |
| Men | 514  (487 to 531) | 549  (531 to 558) | 551  (529 to 588) |
| Women | 495  (466 to 518) | 526  (508 to 543) | 565  (544 to 590) |
| **Standing time, min** | | | |
| All | 90  (85 to 96) | 81  (77 to 89) | 70  (63 to 75) |
| Men | 83  (73 to 89) | 78  (74 to 85) | 73  (63 to 85) |
| Women | 99  (91 to 108) | 87  (78 to 93) | 67  (59 to 74) |
| **Light physical activity, min** | | | |
| All | 185  (180 to 195) | 168  (159 to 176) | 149  (145 to 160) |
| Men | 190  (180 to 200) | 169  (155 to 179) | 150  (145 to 170) |
| Women | 183  (177 to 194) | 168  (159 to 181) | 148  (134 to 165) |
| **Moderate-to-vigorous physical activity, min** | | | |
| All | 45  (39 to 49) | 37  (33 to 40) | 20  (17 to 25) |
| Men | 48  (41 to 57) | 40  (36 to 44) | 25  (18 to 32) |
| Women | 41  (36 to 48) | 34  (27 to 37) | 18  (13 to 24) |
| **Steps** | | | |
| All | 7145  (6518 to 7965) | 6168  (5686 to 6519) | 4085  (3680 to 4637) |
| Men | 7823  (6710 to 8468) | 6257  (5989 to 6597) | 4442  (3805 to 5160) |
| Women | 6475  (6024 to 7830) | 5579  (5131 to 6711) | 3812  (3145 to 4604) |
| **Peak-10min MET** | | | |
| All | 3.79  (3.63 to 4.00) | 3.56  (3.44 to 3.67) | 2.99  (2.87 to 3.11) |
| Men | 3.74  (3.51 to 4.08) | 3.66  (3.47 to 3.81) | 3.10  (2.88 to 3.27) |
| Women | 3.88  (3.63 to 4.03) | 3.44  (3.28 to 3.60) | 2.92  (2.75 to 3.08) |

\*All analyses with bootstrapping (1000 repetitions). Activity variables calculated based on one minute exponential moving average

†Self-reported cardio-metabolic or arthritis disease cluster (reported hypertension, coronary heart disease/myocardial infarction, heart failure, atrial fibrillation, diabetes, rheumatoid arthritis, knee osteoarthritis or hip osteoarthritis but did not report mobility restricting disease).

**Supplementary Table VII. Median of the mid-life mean MET-index from self-reported leisure-time physical activity in 1975, 1981 and 1990\* according to self-reported physician-diagnosed diseases restricting mobility at follow-up and sex.†**

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity/inactivity variable** | **Reported disease restricting mobility (n of persons)** | |  |
| **All**  **Men**  **Women** | **No (n=470)**  **(n=215)**  **(n=255)** | **Yes (n=139)**  **(n=71)**  **(n=68)** |  |
|  | **Median (95% CI)** | | ***P* value‡** |
| **Mid-life leisure-time mean MET-index from years 1975, 1981 and 1990, MET-hours/day** | | |  |
| All | 2.14 (1.94 to 2.29) | 2.04 (1.63 to 2.37) | .167 |
| Men | 2.24 (2.02 to 2.63) | 2.34 (1.57 to 2.74) | .375 |
| Women | 2.05 (1.80 to 2.29) | 1.89 (1.48 to 2.24) | .301 |

\*Previous physical activity habits were assessed from the cohort by questionnaires in 1975, 1981 and 1990. All three questionnaires enabled calculation of the leisure-time MET-index. The MET-index was expressed as the sum-score of leisure-time physical activity MET-hours per day. To estimate the mean volume of physical activity during the three baseline survey years, the average of the MET index values obtained in 1975, 1981, and 1990 was computed and termed mid-life mean MET-index (see reference 23 in the manuscript).

†All analyses with bootstrapping (1000).

**‡***P* values for the difference between those with the disease and those without from linear regression analysis adjusted for sex, age and cluster for family.