

1 **Changes in non-occupational sedentary behaviors across the retirement transition: the**
2 **Finnish Retirement and Aging Study (FIREA)**

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18 **ABSTRACT**

19 **Background** Retirement is a major life transition which may influence health behaviors and
20 time use. Little is known about how sedentary behavior changes as a result of increased time
21 availability after retirement. The aim of this study was to examine changes in non-occupational
22 sedentary behaviors across the retirement transition. In addition, we examined which pre-
23 retirement characteristics were associated with these changes.

24 **Methods** The study population consisted of 2,011 participants from the Finnish Retirement
25 and Aging Study (FIREA). Repeated postal survey including questions on sedentary behavior
26 domains (television viewing, computer use at home, sitting in a vehicle and other sitting) were
27 conducted once a year across the retirement transition, covering on average 3.4 study waves.
28 Linear regression with generalized estimating equations (GEE) was used for the analyses.

29 **Results** Total sedentary time increased by 73 (95% CI 66-80) minutes/day during the
30 retirement transition. Of the domain-specific sedentary behaviors, television viewing time
31 increased by 28 (95% CI 25-32) minutes/day, computer use at home by 19 (95% CI 17-22)
32 minutes/day, and other sitting time by 37 (95% CI 33-41) minutes/day, while time sitting in a
33 vehicle decreased by 6 (95% CI 4-9) minutes/day. Highest increase in total sedentary time was
34 among women and persons who had high occupational sitting time, low physical activity level,
35 sleep difficulties, mental disorders, or poor health before retirement (all P-values for interaction
36 <0.03).

37 **Conclusion** Total and domain-specific sedentary times, except sitting in a vehicle, increased
38 during the retirement transition.

39 **Key words:** sedentary behavior, sitting, retirement, cohort, aging, television viewing

40 **What is already known on this subject?**

41 Retirement is associated with increased time spend sedentary.

42 There are no longitudinal studies with repeated measures of sedentary behavior domains
43 across the retirement transition.

44

45 **What this study adds?**

46 Total and domain-specific sedentary behaviors, except sitting in a vehicle, increase during the
47 retirement transition.

48 Total non-occupational sedentary time continued to increase during the post-retirement
49 period.

50 Women, and those who had high occupational sedentary time, low physical activity level,
51 sleep difficulties, mental disorders, or poor health before retirement were most likely to
52 report an increase in total non-occupational sedentary time during the retirement transition.

53 **BACKGROUND**

54 Sedentary behavior, defined as any waking behavior characterized by an energy expenditure
55 ≤ 1.5 metabolic equivalents (METs) whilst in a sitting or reclining posture [1], is highly
56 prevalent among adult population [2]. Older adults are the most sedentary age group spending
57 65% to 80% of their wake time on sedentary behaviors [3]. This is potentially a public health
58 concern as sedentary behavior is associated with poor health [4,5] and mortality [6,7].

59 Retirement is a major life transition in late mid-life which can cause changes in lifestyle [8].
60 Indeed, previous research has shown that retirement is associated with increased leisure
61 physical activity [9] and sleep duration [10] most likely due to increased time availability,
62 restructure of leisure activities and awareness of one's own health and well-being [11,12].
63 However, retirement has also been listed as a strong determinant for engaging sedentary
64 behavior [13]. To date, only a small number of studies have examined how sedentary behavior
65 changes during the retirement transition [14].

66 Prior longitudinal studies have shown that retirement is associated with increased time spend
67 on television viewing and computer use, and with decreased passive transportation time [8,14–
68 17]. However, previous studies have not been able to follow people with repeat measurements
69 across the retirement transition nor to assess short and long-term changes in both total and
70 domain-specific sedentary behaviors [8,15–17]. Furthermore, prior research has examined
71 changes in sedentary behavior only by education and work-related factors [14]. Yet, multiple
72 other factors, such as lifestyle and health factors, are shown to be associated with sedentary
73 behavior [18] and therefore could potentially affect the changes in sedentary behavior during
74 the retirement transition.

75 To address some of these the limitations, this longitudinal study examined how non-
76 occupational sedentary behavior, such as television viewing, computer use at home, sitting in

77 a vehicle and other sitting, changed across the retirement transition using repeated annual
78 measurements. We also investigated which pre-retirement characteristics were associated with
79 changes in total and domain-specific sedentary time during the retirement transition.

80

81 **METHODS**

82 **Study population**

83 Finnish Retirement and Aging Study (FIREA) is an ongoing longitudinal cohort study of older
84 adults in Finland established in 2013. The aim of the FIREA study is to follow aging workers
85 from work to full-time retirement and to determine how health behaviors and clinical risk
86 factors change during transition to statutory retirement. The eligible population for the FIREA
87 study cohort included all public sector employees whose individual retirement date was
88 between 2014 and 2019 and who were working in year 2012 in one of the 27 municipalities in
89 Southwest Finland or in the 9 selected cities or 5 hospital districts around Finland. Information
90 on the estimated individual retirement date was obtained from the pension insurance institute
91 for the municipal sector in Finland (Keva). Participants were first contacted 18 months prior to
92 their estimated retirement date by sending a questionnaire, which was thereafter sent annually,
93 four times in total. The actual date of retirement was reported by the participants. Due to the
94 eligibility criteria, large majority of the FIREA participants retired based on their age, and not
95 due to disease. The FIREA study was conducted in line with the Declaration of Helsinki, and
96 was approved by the Ethics Committee of Hospital District of Southwest Finland.

97 By the end of 2017, 6,673 (63% of the eligible sample, n=10,629) of the FIREA cohort
98 members had responded to at least one questionnaire and of them 4,311 had responded at least
99 twice to questionnaires, 2,082 both prior and after the actual retirement date reported. The final

100 analytical sample did not differ from the eligible sample (83 vs. 80% of women, 33 vs. 29% of
101 upper grade non manual, 37 vs. 42% of manual workers, respectively).

102 There were two possible study waves before retirement (wave -2, wave -1) and three possible
103 waves after retirement (wave +1, wave +2, wave +3) (Table 1). Each successive wave was one
104 year apart from each other. To be included in this study, the participants had to have
105 information on total sedentary time immediately before and after transition to statutory
106 retirement (i.e. at wave -1 and at wave +1) (n=2,058). We excluded those with missing
107 information on socio-economic status (n=24) and those who were not working full-time or part-
108 time at wave -1 (n=23) resulting in an analytic sample of 2,011 persons. Thus, depending on
109 the retirement date, participants' observations came from one of the following alternative set
110 of waves: 1) wave -2, wave -1, wave +1, wave +2, or, 2) wave -1, wave +1, wave +2, and wave
111 +3. On average, these participants provided information on total sedentary time at 3.4 (range
112 2-4) of the possible four study waves.

113

114 **Assessment of sedentary behavior**

115 Sedentary behavior was inquired at each study wave with a question: "On average, how many
116 hours on a non-weekend days you spend on sitting: 1) at the office, 2) watching television or
117 videos at home, 3) using computer at home, 4) in a vehicle (car, train, airplane), and 5) other
118 sitting?" Response alternatives for each domain were: 0 (sitting less than an hour or not at all),
119 1, 2, ..., 9, ≥ 10 hours per day, coded as 0 to 10 hours, respectively. We calculated a total non-
120 occupational sedentary time by summing up sitting times for television viewing, computer use,
121 vehicle and other.

122 **Assessment of covariates**

123 Sex, date of birth, and occupational status were obtained from the pension insurance institute
124 for the municipal sector in Finland (Keva). Occupational status was categorized into three
125 groups according to the occupational titles by the last known occupation preceding retirement:
126 upper-grade non-manual workers (e.g. teachers, physicians), lower-grade non-manual workers
127 (e.g. registered nurses, technicians) and manual workers (e.g. cleaners, maintenance workers).
128 All other covariates were based on the responses in the last questionnaire prior to retirement
129 (wave -1). These covariates were selected because they have been shown to be associated with
130 sedentary behavior [18] and might influence the decision to retire [19]. Work status was divided
131 into full-time or part-time workers and marital status into married/cohabiting or not
132 married/other. Heavy physical work (no vs. yes) was assessed by using validated gender-
133 specific job exposure matrix (JEM) for physical exposures [20,21]. Occupational sedentary
134 time before the retirement transition was categorized as: <4 hours, 4 to <6 hours, 6 to <8 hours
135 and ≥ 8 hours daily.

136 Physical activity was assessed with a question on average weekly duration and intensity of
137 leisure and commuting physical activity during the past year. Weekly physical activity was
138 expressed as metabolic equivalent (MET) hours and categorized as: low (<14 MET
139 hours/week), moderate (14 to <30 MET hours/week), and high (≥ 30 MET hours/week) activity
140 levels [22]. Body mass index (BMI) was calculated from self-reported weight and height and
141 categorized into: underweight (<18.5 kg/m²), normal weight (18.5 to <25.0 kg/m²), overweight
142 (25 to <30 kg/m²) and obese (≥ 30 kg/m²) [23]. The participants reported their habitual
143 frequency and amount of beer, wine, and spirits consumption, in weekly units of alcohol.
144 Heavy alcohol use (no vs. yes) was defined as >16 drinks/week for women and >24
145 drinks/week for men, as these limits correspond with the lower limit for heavy use of alcohol
146 set by the Finnish Ministry of Health and Social Affairs [24]. Smoking status was categorized
147 into non-smokers (never and former) and current smokers. Sleep difficulties were measured

148 with the Jenkins Sleep Problem Scale [25] and categorized as no sleep difficulties (sleep
149 difficulties ≤ 1 night/week), moderate sleep difficulties (2-4 nights/week), or severe sleep
150 difficulties (5-7 nights/week) [26].

151 Data on chronic diseases was based on question “Have your doctor ever told that you have or
152 have had” and following diseases were taken into account: angina pectoris, myocardial
153 infarction, stroke, claudication, osteoarthritis, osteoporosis, sciatica, fibromyalgia, rheumatoid
154 arthritis, migraine, and malign cancer. For the analyses, participants were categorized into
155 having 0, 1, >1 chronic diseases. Mental disorders included depression and/or other mental
156 diseases (no vs. yes). Self-rated health was assessed with a 5-point scale (1=good, ..., 5=poor),
157 and was then categorized as good (1-2), average (3), and poor (4-5) health. Psychological
158 distress was measured with the 12-item version of General Health Questionnaire (GHQ-12),
159 which gives a total score ranging from 0 to 12. A cut-off point of three or more symptoms was
160 used to indicate psychological distress (no vs. yes) [27].

161

162 **Statistical analysis**

163 Characteristics of the study population before retirement (at wave -1) are presented as numbers
164 and percentages for categorical variables and as means and standard deviations (SDs) for
165 continuous variables. We first calculated mean estimates and their 95% confidence intervals
166 (CI) for the total and domain-specific sedentary times in each study wave to illustrate the levels
167 of these behaviors across the retirement transition (from wave -2 to wave +3). We used linear
168 regression analyses with generalized estimating equations (GEE). The GEE models control for
169 the intra-individual correlation between repeated measurements using an exchangeable
170 correlation structure and is not sensitive to measurements missing completely at random
171 [28,29]. The difference in the mean change in total and domain-specific sedentary times

172 between two specific time periods: the retirement transition period (from wave -1 to wave +1)
173 and the post-retirement period (from wave +2 to wave +3) were tested using a period*time
174 interaction term.

175 We also examined whether sociodemographic and work-related factors (sex, occupational
176 status, work status, marital status, heavy physical work and occupational sedentary time),
177 lifestyle factors (physical activity, BMI, heavy alcohol use, current smoking status, sleep
178 difficulties), and health factors (number of chronic diseases, mental disorders, self-reported
179 health, and psychological distress) before retirement were associated with the magnitude of
180 changes in total and domain-specific sedentary times during the retirement transition (from
181 wave -1 to wave +1). For these analyses, the interaction term pre-retirement factor*time was
182 added to the GEE models. All models were adjusted for age, sex, and occupational status. The
183 SAS 9.4 Statistical Package was used for all of the analyses (SAS Institute Inc., Cary, NC).

184

185 **RESULTS**

186 Characteristics of the study population are shown in Table 2. Before the retirement transition
187 (at wave -1), the mean age of the study population was 63.2 (SD 1.3) years, 39% had low
188 physical activity level, 38% had normal BMI, and 28% were free of chronic diseases. The mean
189 time spent being sedentary at leisure was 4.7 (95% CI 4.5-4.8) hours/day. The total sedentary
190 time before retirement differed by sex, work and marital status, physical strenuousness of the
191 work, physical activity level, BMI category, alcohol use, severity of sleep difficulties, self-
192 reported health, and psychological distress ($P < 0.05$ for all).

193 Figure 1 illustrates the changes in total and domain-specific non-occupational sedentary times
194 across the retirement transition. The total sedentary time, including sitting time for television
195 viewing, computer use, vehicle and other, increased by 73 minutes/day to 5.9 hours/day during

196 the retirement transition and continued to increase by 18 minutes/day to 6.2 hours/day during
197 the post-retirement period. Thus the change in total sedentary time during the retirement
198 transition was four times that of change during the post-retirement period (period*time
199 interaction $p < .0001$). Of the domain-specific sedentary behaviors, television viewing time
200 increased by 28 minutes/day to 2.7 hours/day, computer use at home by 19 minutes/day to 1.1
201 hours/day, and time spent on other sitting activities by 37 minutes/day to 1.6 hours/day during
202 the retirement transition. Time sitting in a vehicle decreased by 6 minutes/day during retirement
203 transition. Computer use and other sitting times continued to increase during the post-
204 retirement period (by 5 and 8 minutes/day, respectively).

205 Table 2 presents mean estimates for the change in total non-occupational sedentary time during
206 the retirement transition by the pre-retirement characteristics. Supplemental Tables 1-3 present
207 results for domain-specific sedentary times. Women increased their total sedentary time more
208 than men during the retirement transition (77 vs. 56 minutes/day, sex*time interaction $p = 0.01$).
209 Changes in total sedentary time across the retirement transition among men and women are
210 shown in Supplemental Figure 1.

211 Those who retired from full-time jobs increased total sedentary time more than those who
212 retired from part-time jobs (78 vs. 62 minutes/day, pre-retirement job status*time interaction
213 $p = 0.02$). This was also seen for the change in television viewing time (Supplemental Table 1).
214 Those who had high pre-retirement occupational sedentary time reported higher increase in
215 total sedentary time during the retirement transition than those who had low occupational
216 sedentary time (98 vs. 65 minutes/day, pre-retirement occupational sedentary time*time
217 interaction $p < 0.0001$). This association was also seen for the changes in computer use
218 (Supplemental Table 2) and other sitting time (Supplemental Table 3). In addition, those who
219 had low pre-retirement physical activity level reported higher increase in total sedentary time
220 during the retirement transition than those who had high pre-retirement physical activity level

221 (79 vs. 62 minutes/day, pre-retirement activity level*time interaction $p=0.02$). The pre-
222 retirement physical activity level was also associated with the change in television viewing
223 time (Supplement Table 1).

224 Among those with severe sleep difficulties before retirement, the increase in total sedentary
225 time during the retirement transition was reported to be higher than among those who had no
226 pre-retirement sleep difficulties (89 vs. 64 minutes/day, pre-retirement sleep difficulties*time
227 interaction $p=0.002$). Sleep difficulties were also associated with the change in sitting time for
228 computer use (Supplemental Table 2). Those who had chronic diseases reported higher increase
229 in total sedentary time during the retirement transition than those who had no chronic diseases
230 before retirement (79 vs. 61 minutes/day, pre-retirement disease status*time $p=0.03$).
231 Furthermore those who had mental disorders before retirement increased their total sedentary
232 time more than those who had no pre-retirement mental disorders (94 vs. 71 minutes/day, pre-
233 retirement mental health*time interaction $p=0.009$). In addition, self-reported health before
234 retirement was associated with the change in total sedentary time: those reporting poor health
235 increased their total sedentary time more than those reporting good health (96 vs. 68
236 minutes/day, pre-retirement health*time interaction $p=0.03$). Self-reported health showed
237 strongest association with increased television viewing time (Supplemental Table 1). Also
238 psychological distress before retirement was associated with the changes in television viewing
239 time (Supplemental Table 1) and computer use (Supplemental Table 2) during the retirement
240 transition.

241

242 **DISCUSSION**

243 This is apparently the first longitudinal study examining changes in non-occupational sedentary
244 behavior across the retirement transition. Total sedentary time as well as television viewing

245 time, computer use at home, and other sitting time increased during the retirement transition.
246 Total sedentary time, and especially computer use and other sitting time, continued to increase
247 during the years following retirement. Women, and those who had high occupational sedentary
248 time, low level of physical activity, sleep difficulties, mental disorders, or poor health before
249 retirement were most likely to report an increase in total sedentary time during the retirement
250 transition. Compared to previous studies, an advantage of the present investigation is the
251 analysis of annual changes in sedentary behavior using repeated measures of domain-specific
252 sedentary behaviors across the retirement transition. In addition, we studied the associations
253 between pre-retirement characteristics and the changes in total and domain-specific sedentary
254 time during the retirement transition.

255 Our finding that total sedentary time, television viewing, computer use, and other sitting time
256 increase during the retirement transition corresponds to previous longitudinal findings showing
257 higher increase in total leisure sedentary time [16], television viewing time [8,15,16], and
258 computer time [16] among retiring adults than among those who remained employed. As
259 sedentary behavior in general [2,4] and television viewing specifically [30–32] are related to
260 adverse health outcomes among older adults, our findings, among others, suggest that more
261 attention should be paid to reducing overall sedentary behavior and especially television
262 viewing time after transitioning to retirement. We also observed that total, computer use at
263 home, and other sitting time continued to increase in the years following retirement. However,
264 computer use and other sitting time increased to lower absolute level of sedentary behavior per
265 day than television viewing. It is worth noting that computer use is mentally activating
266 compared to passive television viewing[33], and may not be as harmful for health among older
267 adults [34]. Despite the overall increase in sedentary behavior during retirement, we also
268 observed that sitting in a vehicle decreased during the retirement transition. Similarly to our
269 finding, a previous study has shown that passive transportation decreases more among retiring

270 than among already retired adults [17]. This decrease is probably mostly due to absence of
271 commuting-related passive transportation after retirement.

272 A unique feature in our study is that we included a wide range of pre-retirement characteristics
273 that could affect the magnitude of change in total and domain-specific sedentary behaviors
274 during the retirement transition. We found that women increased their total sedentary time
275 more than men, although men were more sedentary before retirement. Also high occupational
276 sedentary time before the retirement transition was associated with greater increase in total,
277 computer use and other sitting time during the retirement transition. Similar relationships were
278 also seen in previous studies where higher work-related sitting [35] and physically demanding
279 job [15] associated with greater increase in screen time after retirement. Although less educated
280 adults [17] and those retiring from manual social class [16] have previously been shown to be
281 more susceptible to increase television viewing time after retirement, we did not observe
282 similar associations.

283 According to our findings, high level of physical activity before retirement was associated with
284 less increase in total and television viewing time during the retirement transition. Another novel
285 finding is that those who had sleep difficulties, mental disorders or poor health before
286 retirement were most likely to report an increase in total sedentary time during the retirement
287 transition. Sleep difficulties were associated with increased sitting time for computer use
288 whereas poor self-reported health associated with increased television viewing time. In
289 addition, pre-retirement psychological distress was associated with increased television
290 viewing and computer use after retirement. These findings adds to previous studies which have
291 found that sedentary behavior is associated with poor sleep quality [36], poor mental health
292 [37,38] and increased risk of depression [39,40].

293 The main limitation of this longitudinal study is the reliance on self-reported data, which can
294 lead to bias and underreporting of sedentary time [3]. To our knowledge the questionnaire used
295 in this study is not validated against objective measurements of sedentary behavior. In addition,
296 since we calculated the total non-occupational sedentary time based on the time used in
297 different domains, we were not able to control the simultaneity of domain-specific sedentary
298 behaviors. This may have led to slight overestimation of the total sedentary time. However, the
299 assessment of sedentary behavior as self-reported hours/day is frequently used in observational
300 studies [7] and we were able to use the same questions of domain-specific sedentary behaviors
301 in each of the study waves. Future studies with objective monitoring of sedentary time are
302 therefore needed to fully understand the changes in sedentary behavior during the retirement
303 transition.

304 There are also some other methodological issues that deserve discussion. We only assessed
305 sedentary time on non-weekend days. This can be a limitation, because sedentary time may be
306 different in weekend vs. week days among older adults [41]. On the other hand, by focusing
307 on week-days only we were able to better capture changes in sedentary behavior when week-
308 day routines change after retirement. In addition, we did not include occupational sedentary
309 time in the calculation of total sedentary time because occupational sitting disappears after
310 retiring from work [16] and this would have masked the increase in non-occupational sedentary
311 behavior [14]. Instead we examined changes in sedentary behavior during the retirement
312 transition based on the levels of pre-retirement occupational sedentary time. Finally, the study
313 population is representative of the Finnish public sector employees, however, the results may
314 not necessarily be generalizable to other sectors.

315

316

317 **Conclusions**

318 Total non-occupational sedentary time and television viewing, computer use and other sitting
319 time increased during the retirement transition. Total sedentary time continued to increase
320 during the post-retirement period. Women and adults who had high occupational sedentary
321 time, low physical activity level, sleep difficulties, mental disorders, or poor health before
322 retirement were most likely to report an increase in time spend sedentary after the retirement
323 transition. However, objective measurements of sedentary behavior are needed to fully
324 understand the changes in sedentary behavior across the retirement transition.

325

326 **Contributionship** SS and JV designed this study and the data collection. TL analyzed the
327 data and drafted the manuscript. All authors contributed to data interpretation, revised article
328 critically, and approved the final version of manuscript.

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334 **Data sharing** The datasets used and analyzed during the current study are available from the
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336 **Ethical approval** The FIREA study is conducted in line with the Declaration of Helsinki,
337 and was approved by the Ethics Committee of Hospital District of Southwest Finland.

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343

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471

472

473

474 **Figure Labels**

475 **Figure 1. Total and domain-specific sedentary times across the retirement transition.**

476 **Adjusted for age, sex and occupational status.**

477

478 **Tables**

479 **Table 1. Study design. Annual study waves around retirement and the construction of the**
 480 **pre-retirement, retirement transition and post-retirement periods.**

Pre-retirement period	Retirement transition		Post-retirement period		
<i>n</i> =955	<i>n</i> =2,011	RETIREMENT	<i>n</i> =2,011	<i>n</i> =1,211	<i>n</i> =547
	wave -1		wave +1	wave +2	wave +3
wave -2	wave -1		wave +1	wave +2	

481

Underweight	7	0.5	4.72	3.36	6.09	NA			
Normal weight	757	38	4.38	4.20	4.55	1.19	1.03	1.35	
Overweight	806	41	4.56	4.41	4.71	1.20	1.03	1.36	
Obese	414	21	5.31	5.06	5.55	1.30	1.06	1.54	
Heavy alcohol use									0.83
No	1837	92	4.60	4.47	4.72	1.23	1.11	1.35	
Yes	164	8	5.19	4.80	5.58	1.20	0.86	1.53	
Current smoking									0.32
No	1802	91	4.62	4.48	4.75	1.21	1.09	1.33	
Yes	172	9	4.90	4.53	5.28	1.39	1.05	1.73	
Sleep difficulties									0.002
No	985	49	4.54	4.38	4.69	1.06	0.91	1.21	
Moderate	460	23	4.78	4.57	4.99	1.22	1.00	1.44	
Severe	565	28	4.77	4.58	4.97	1.48	1.28	1.68	
Number of chronic diseases									0.03
0	540	28	4.60	4.42	4.79	1.02	0.83	1.21	
1	745	38	4.64	4.45	4.82	1.29	1.12	1.47	
≥ 2	655	34	4.71	4.52	4.89	1.32	1.13	1.50	
Mental disorders									0.01
No	1527	84	4.63	4.49	4.78	1.18	1.05	1.31	
Yes	285	16	4.80	4.53	5.07	1.56	1.29	1.83	
Self-reported health									0.03
Good	1492	74	4.52	4.38	4.65	1.13	1.00	1.26	
Average	438	22	4.92	4.70	5.13	1.40	1.18	1.63	
Poor	78	4	5.70	5.07	6.34	1.60	1.11	2.10	
Psychological distress									0.08
No	1760	88	4.62	4.48	4.75	1.18	1.06	1.30	
Yes	243	12	4.90	4.61	5.18	1.46	1.16	1.77	

486 ¹P-value for interaction with time

487

488 **Supplement material**

489

490 **Supplemental Figure 1. Total sedentary time across the retirement transition among**
491 **men and women.**

492

493 **Supplemental Table 1. Television viewing time before retirement (wave -1) and mean**
494 **changes in television viewing time during the retirement transition period (from wave -1**
495 **to wave +1) by pre-retirement characteristics of the population. All models adjusted for**
496 **age, sex and occupational status.**

497

498 **Supplemental Table 2. Computer use at home before retirement (wave -1) and mean**
499 **changes in computer use during the retirement transition period (from wave -1 to wave**
500 **+1) by pre-retirement characteristics of the population. All models adjusted for age, sex**
501 **and occupational status.**

502

503 **Supplemental Table 3. Other sitting time before retirement (wave -1) and mean changes**
504 **in other sitting time during the retirement transition period (from wave -1 to wave +1)**
505 **by pre-retirement characteristics of the population. All models adjusted for age, sex and**
506 **occupational status.**