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Research Article

Correlations of Subjective and Social Well-Being With Sedentary Behavior and Physical Activity in Older Adults—A Population-Based Study

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Abstract

Background: Subjective and social well-being, avoiding sedentary behavior (SB), and engaging in physical activity (PA) are important factors for health in older adults, but the extent to which they are related to each other remains unclear. We aimed to investigate these correlations, and whether they differ by age.

Method: A cross-sectional study was carried out in 595 people aged 66 years and older, from the Swedish National study on Aging and Care in Kungsholmen. Subjective and social well-being (life satisfaction, positive and negative affect, social connections, social support, and social participation) were assessed through validated questionnaires and activPAL3 accelerometers provided information on SB and PA. Data were analyzed using multi-adjusted quantile regression models.

Results: Higher positive affect was significantly associated with less daily sitting time (β = −27.08, 95% confidence interval [CI]: −47.77, −6.39) and higher levels of light PA (LPA) (β = 40.67, 95% CI: 21.06, 60.28). Higher levels of social support and social participation were associated with less daily sitting time (β = −22.79, 95% CI: −39.97, −5.62; and β = −21.22, 95% CI: −39.99, −2.44) and more time in LPA (β = 23.86, 95% CI: 4.91, 42.81; and β = 25.37, 95% CI: 6.27, 44.47). Stratified analyses suggested that the associations of positive affect and social participation were strongest for individuals aged 80 years and older.

Conclusions: Our results suggest that older adults with higher levels of subjective and social well-being spend less time sitting and engage more in PA. This was especially evident among the oldest-old individuals. Future research should longitudinally investigate the directionality of these correlations.

Keywords: Accelerometry, Aging, Physical activity, Sitting time, Well-being

There is strong evidence to suggest that older adults who participate in more physical activities (PAs) have lower rates of mortality, cardiometabolic diseases, cancer, better cognitive function, and less functional limitations (1). Furthermore, in recent years, sedentary behavior (SB) has been associated with negative health outcomes in older adults independent of PA (2), and is more prevalent in this age group compared to any other age groups (3).

Subjective and social well-being are essential components of what older people view as successful aging (4). Previous studies indicated that higher levels of subjective and social well-being are associated with reduced risk of cardiovascular disease, cognitive decline, frailty, and mortality (5–7). Subjective well-being, often labeled as psychological well-being, reflects a multidimensional understanding of well-being including aspects related to self-acceptation, positive relations, autonomy, environmental mastery, personal growth, and purpose in life (8). Such a conception was further developed by Ed Diener et al. to encompass the measures of life satisfaction, positive affect, and negative affect (9). Social well-being is an umbrella term

that measures people's experiences of interpersonal relationships, in terms of closeness to others and sense of trust (10). It can include different dimensions or types of social behaviors and activities, such as social connections, social support, and social participation (6).

It has been suggested that experiencing higher levels of subjective and social well-being leads to better health outcomes by promoting a healthy lifestyle in older adults (11–15), while a reversed association may also occur (16). Furthermore, we have previously shown that high levels of subjective and social well-being may slow down the age-related decline in physical function (17). To address the burden of sedentary lifestyle and poor subjective and social well-being in older adults, a first step may be to establish whether cross-sectional relationships exist. Most previous studies on correlates and determinants of SB and PA in older adults have investigated exclusively sociodemographic factors (eg, marital status, income, living arrangements) (18–21). Only a handful have focused on subjective and social well-being, and with inconsistent results (18–21). Moreover, most of these studies used self-reported information of SB and PA, which may introduce report or recall bias (18–21). Finally, despite previous findings on age-related differences in the neural mechanisms behind emotion processing (22), and the fact that older people often experience a gradual loss of social contacts over time (6), it is unknown whether any of the aforementioned relationships also show an age-related gradient.

Thus, the aims of this study were to examine the cross-sectional correlations between subjective and social well-being and objectively measured SB and PA among older adults. Additionally, we wanted to determine whether any of these correlations differed by age.

Method

Study Population

We used data from the Swedish National Study on Aging and Care in Kungsholmen (SNAC-K) (www.snac-k.se), a population-based longitudinal study of adults aged 60 years and older (23). At baseline (2001–2004), a random sample of 3363 individuals (73.3% participation rate) were selected from each of 11 age groups (60, 66, 72, 78, 81, 84, 87, 90, 93, 96, and ≥99 years). For younger cohorts (60–78 years), follow-up examinations were performed every 6 years and for older cohorts (78+ years), every 3 years. In the sixth wave of follow-up, between 2016 and 2018, objective assessment of SB and PA, using activPAL3 accelerometers, was introduced into the study (24). Of the 1287 participants from age groups 66, 81, 84, 87, 90, 93, and ≥96 years examined during this period, 680 were considered eligible (excluding those with either severe cognitive impairment, or not able to move indoors without assistance) and agreed to wear the activPAL3 for 7 consecutive days. Of these, 24 persons were excluded due to either device malfunction (n = 4), device not worn according to the instructions (n = 2), or <4 valid days of measurements (n = 18). A measurement day was considered valid if the wear time was at least 10 hours during waking hours (24). Among the remaining 656 individuals with valid information for SB and PA, 595 had complete information for either subjective (n = 520) or social well-being (n = 550).

Assessment of SB and PA

Sedentary behavior and PA were assessed with the activPAL3 accelerometer (PAL Technologies Ltd, Glasgow). The activPAL3 uses information on thigh position and acceleration to determine body posture and movement with high accuracy, that is, sitting/lying or standing, and stepping speed (cadence) (25). During the examinations, participants were asked to wear the activPAL3 on the thigh for 7 consecutive days during waking hours while behaving as usual, and to take off the device when doing water-based activities. Time of donning and removal were recorded on a log-sheet everyday by the participants. Devices and log-sheets were returned by mail in a prepaid envelope. The activPAL3 files were processed using the PALbatch software v8.10.6.33. A custom-made syntax for the SAS programming system was used for further analyses of the event files from the PALbatch software and to remove log-reported non-wear time.

Variables for SB included daily time spent sitting (min/d) and number of sit-to-stand transitions per sitting hour. Variables for PA included daily time spent in light PA (LPA; min/d), and daily time spent in moderate-to-vigorous PA (MVPA; min/d). We classified LPA as moving at a cadence <100 steps/min or standing still, and MVPA as moving at a cadence ≥100 steps/min, since this value has been suggested as a threshold for 3 metabolic equivalents (26). Correlations between daily time spent sitting, sit-to-stand transitions, LPA, and MVPA were assessed using Pearson's test. All correlations were statistically significant (p < .001) (Supplementary Table 1).

Subjective and Social Well-Being

Subjective well-being was assessed using the self-reported 20-item Life Satisfaction Index A (LSI-A) (27) and the 10-item Positive and Negative Affect Schedule (28). A detailed description is presented in Supplementary Table 2. The scale reliability coefficients (ie, alpha coefficients) for LSI-A, Negative Affect Schedule, and Positive Affect Schedule are 0.8383, 0.7425, and 0.8508, respectively, which are acceptable. The LSI-A was specifically developed to capture 5 components of life satisfaction in older adults: zest versus apathy, resolution and fortitude, congruence between desired and achieved goals, positive self-concept, and mood tone (27). Each of the 20 items in the LSI-A was responded with "agree," "disagree," or "uncertain." A higher score in the LSI-A generally indicates greater levels of satisfaction (27). Positive and Negative Affect Schedule examines individuals' subjective well-being using positive and negative affective components which capture their affective states during the last 4 weeks (28). Positive affect reflected to what extent a person felt active, inspired, determined, alert, or enthusiastic. Negative affect reflected to what extent a person felt distressed, upset, scared, nervous, or afraid. Participants responded to each question with "not at all," "a little," "somewhat," "quite a bit," or "very much" (28).

Information about levels of social connections, social support, and social participation was assessed from demographic information and validated questionnaires in accordance with the National Social Life, Health, and Aging Project (29). A detailed description is presented in Supplementary Table 2. For social connections, individuals were asked about marital status; cohabitation status; parenthood; friendships; social network size; and frequency of direct or remote contacts with parents, children, relatives, neighbors, and friends (30). For social support, individuals were asked about the reported satisfaction with aforementioned contacts; perceived material and psychological support; sense of affinity with association members, relatives, and residence area; and being part of a group of friends (30). For social participation, individuals were asked about the frequency of attending the theatre, concerts, or art exhibitions; travelling; playing cards/games; or participating in social groups or a pension organization (30).

These 6 variables were converted into z scores based on the mean and standard deviation and then categorized into "low" and "high"

relative to the median (ie, 0.22 for life satisfaction, 0.23 for positive affect, –0.30 for negative affect, 0.06 for social connections, 0.09 for social support, and 0.002 for social participation).

Covariates

Sociodemographic covariates included: age (continuous), sex, and highest level of formal education (elementary school, high-school, or university and above). Lifestyle-related covariates included smoking status (never, former, or current); alcohol consumption (never/occasional, light to moderate, or heavy consumption); and body mass index (BMI) (31), categorized as underweight <20, normal 20–24, overweight 25–29, and obese ≥30 kg/m^2. Information on chronic diseases were ascertained based on medical records, clinical examination, and patient history. A disease was defined as chronic if it was of prolonged duration and left residual disability; worsened quality of life; or required a long period of care, treatment, or rehabilitation (32). Chronic diseases were operationalized as the number of: (a) cardiovascular diseases (ischemic heart disease, heart failure, atrial fibrillation, cerebrovascular diseases, cardiac valve diseases, bradycardias or conduction diseases, peripheral vascular disease, and other cardiovascular diseases); (b) neuropsychiatric diseases (depression and mood diseases, dementia, neurotic or stress-related and somatoform diseases, migraine and facial pain syndromes, peripheral neuropathy, Parkinson or parkinsonism, epilepsy, schizophrenia and delusional diseases, multiple sclerosis, other psychiatric or behavioral diseases, and other neurological diseases); and (c) musculoskeletal diseases (dorsopathies, inflammatory arthropathies, osteoarthritis and other degenerative joint diseases, osteoporosis, and other musculoskeletal and joint diseases). Physical function was assessed with the chair stand test. The test was performed by asking participants to fold their arms across their chests and to stand up from a sitting position and then sit down, 5 times, as quickly as possible, and was categorized depending on their ability to perform the task (yes/no) (33). Personality traits (ie, neuroticism, extraversion, and openness) influence well-being and sociability and are the source of behaviors (34), and were assessed with a short version of the self-reported NEO 5-Factor Inventory (NEO-FFI) questionnaire and subsequently categorized into low, moderate, and high levels (35).

Data Analysis

Quantile regression models were used to estimate β coefficients with 95% confidence intervals (CIs) for the associations between each indicator of subjective well-being (life satisfaction and positive and negative affect) and social well-being (social connections, support, and participation), and each outcome. Models were adjusted for average daily wear time of the activPAL3 accelerometer, age, sex and education level, smoking status, alcohol consumption, BMI, chair stand test, number of cardiovascular diseases, number of neuropsychiatric diseases, number of musculoskeletal diseases, and personality traits. For the stratification analyses, we categorized participants into 2 age groups: a younger group (<70 years old) and an older group (≥80 years old). Interactions of each subjective variable with age were tested using the Wald test. Stratified analyses were performed when statistically significant interactions were detected ($p < .05$). We replaced missing values in categorical covariates with a dummy category and in continuous variables with the median value. A sensitivity analysis was further conducted by excluding individuals with missing values in at least one of the covariates (complete case analysis). Stata 16.0 was used for all data analysis.

Results

Table 1 presents the clinical characteristics and levels of SB and PA for participants with complete information for either subjective or social well-being ($n = 595$), stratified by age. The average age for the younger age group (<70 years old) was 66.1 and for the older age group (≥80 years old) was 81.9. Compared with the older group, the younger group were better educated, had fewer cardiovascular and musculoskeletal diseases, and included smaller proportions of women and of people with physical impairment. However, the younger group included larger proportions of former or current smokers, and of people consuming alcohol. There were no differences in BMI, number of neuropsychiatric diseases, or personality traits (ie, neuroticism, extraversion and openness) between the 2 age groups. Although there were no significant differences in daily sitting time between the 2 age groups, individuals in the older group tended to have fewer sit-to-stand transitions per sitting hour and less time spent in LPA and MVPA per day.

As shown in Table 2, higher positive affect was significantly associated with less daily sitting time (β = –27.08, 95% CI: –47.77, –6.39) and higher levels of LPA (β = 40.67, 95% CI: 21.06, 60.28). However, there were no significant associations of any of the behaviors with life satisfaction and negative affect. Higher levels of social support and social participation were associated with less daily time spent sitting (β = –22.79, 95% CI: –39.97, –5.62; and β = –21.22, 95% CI: –39.99, –2.44, respectively) and more time spent in LPA (β = 23.86, 95% CI: 4.91, 42.81; and β = 25.37, 95% CI: 6.27, 44.47, respectively). Yet, no significant associations were found between any of the behaviors and social connections. After performing sensitivity analyses by excluding individuals with missing values in at least one of the adjusted confounders, the magnitude and direction of point estimates were largely similar comparing the results to the main analysis, though CIs tended to be wider (Supplementary Table 3).

After performing the Wald tests, statistically significant interactions were found between age (<70 vs ≥80 years old) and positive affect and social participation for several outcomes ($p \leq .05$) (Supplementary Table 4). We therefore performed stratified analysis by age. The associations of positive affect and social participation with less sitting time and higher LPA were stronger in the older than in the younger group (Figure 1). Furthermore, social participation was associated with MVPA only in the older age group (Figure 1).

Discussion

In this population-based study of older adults, we found that higher levels of positive affect, social support, and social participation were strongly associated with less daily time spent sitting and more time spent in LPA. Associations involving positive affect and social participation were generally stronger in individuals aged 80 years and older compared to those younger than 70 years.

To our knowledge, no previous studies have presented such a holistic view of the correlations between different indicators of subjective and social well-being, and PA and SB in an older population using objectively measured activity data. Our results are in line with previous studies, which support the association between different dimensions of subjective well-being (eg, life satisfaction; dispositional optimism; control, autonomy, self-realization, and pleasure as a whole; mental health, etc.) and higher levels of PA in older people (12, 36–38). However, only few studies have examined subjective well-being in relation to objective measures of SB and PA. By using

Table 1. Characteristics of the Study Population by Age (*n* = 595)

Characteristics	Age < 70 (*n* = 349)	Age ≥ 80 (*n* = 246)	*p* Value
Age, median (IQR)	66.1 (66.0, 66.3)	81.9 (81.1, 86.9)	<.001
Sex, female, *n* (%)	210 (60.2%)	172 (69.9%)	.015
Education level, *n* (%)			
<9 y	0 (0.0%)	14 (5.7%)	<.001
9–12 y	116 (33.2%)	126 (51.2%)	
>12 y	233 (66.8%)	106 (43.1%)	
Smoking status, *n* (%)			
Never	301 (86.2%)	235 (95.5%)	<.001
Former	16 (4.6%)	2 (0.8%)	
Current	31 (8.9%)	9 (3.7%)	
Alcohol consumption, *n* (%)			
No or occasional	42 (12.0%)	67 (27.2%)	<.001
Light to moderate	213 (61.0%)	121 (49.2%)	
Heavy	82 (23.5%)	52 (21.1%)	
Body mass index, median (IQR)			
<20 (underweight)	158 (45.3%)	101 (41.1%)	.15
20–24.9 (normal weight)	7 (2.0%)	13 (5.3%)	
25–29.9 (overweight)	134 (38.4%)	91 (37.0%)	
≥30 (obesity)	48 (13.8%)	35 (14.2%)	
Number of cardiovascular diseases, median (IQR)	0 (0, 0)	0 (0, 1)	<.001
Number of neuropsychiatric diseases, median (IQR)	0 (0, 0)	0 (0, 0)	.89
Number of musculoskeletal diseases, median (IQR)	0 (0, 1)	1 (0, 2)	<.001
Personality traits			
Neuroticism, *n* (%)			
Low	135 (38.7%)	116 (47.2%)	.20
Moderate	104 (29.8%)	62 (25.2%)	
High	79 (22.6%)	59 (24.0%)	
Extraversion, *n* (%)			
Low	78 (22.3%)	62 (25.2%)	.85
Moderate	121 (34.7%)	85 (34.6%)	
High	119 (34.1%)	90 (36.6%)	
Openness, *n* (%)			
Low	125 (35.8%)	70 (28.5%)	.055
Moderate	80 (22.9%)	72 (29.3%)	
High	113 (32.4%)	95 (38.6%)	
Chair stand test, not able, *n* (%)	7 (2.0%)	48 (19.5%)	<.001
Sedentary behavior, median (IQR)			
Sitting time, min/d	507.1 (452.2, 568.4)	517.6 (467.6, 576.8)	.12
Sit-to-stand transitions (*n*/sitting hour)	5.5 (4.4, 6.8)	4.6 (3.6, 5.8)	<.001
Physical activity, median (IQR)			
Daily time spent on LPA, min	308.3 (256.2, 367.9)	293.6 (237.5, 347.8)	.008
Daily time spent on MVPA, min	34.8 (21.4, 57.2)	14.0 (4.0, 28.8)	<.001
Subjective well-being, *n* (%)			
Life satisfaction			
Low	140 (45.5)	151 (71.2)	<.001
High	168 (54.6)	61 (28.8)	
Positive affect			
Low	142 (46.1)	147 (69.3)	<.001
High	166 (53.9)	65 (30.7)	
Negative affect			
Low	182 (59.1)	129 (60.9)	.69
High	126 (40.9)	83 (39.2)	
Social well-being, *n* (%)			
Social connection			
Low	144 (43.6)	120 (54.6)	.012
High	186 (56.4)	100 (45.5)	
Social support			
Low	152 (46.1)	120 (54.6)	.05
High	178 (53.9)	100 (45.5)	
Social participation			
Low	174 (52.7)	137 (62.3)	.03
High	156 (47.3)	83 (37.7)	

Note: IQR = interquartile range; LPA = light physical activity; MVPA = moderate-to-vigorous physical activity. Study population with complete data for either subjective or social well-being included 595 individuals (percentage of missing: 0.2% for smoking status, 3.0% for alcohol consumption, 1.3% for body mass index, 6.7% for personality traits, and 0.7% for chair stand test). Among those, 520 had complete data for life satisfaction and positive and negative affect, and 550 had complete data for social connections, support, and participation.

Table 2. Beta Coefficients and 95% CIs for the Correlations Between Subjective/Social Well-Being and SB/PA in the Total Sample

	Sitting Time (min/d)	Sit-to-Stand Transitions (*n*/sitting hour)	LPA (min/d)	MVPA (min/d)
Subjective well-being (*n* = 520)				
Life satisfaction				
Low	Reference	Reference	Reference	Reference
High	−16.33 (−37.06, 4.40)	−0.17 (−0.57, 0.22)	13.89 (−6.51, 34.30)	5.11 (−0.40, 10.60)
Positive affect				
Low	Reference	Reference	Reference	Reference
High	−27.08 (−47.77, −6.39)	0.22 (−0.17, 0.61)	40.67 (21.06, 60.28)	1.56 (−3.78, 6.90)
Negative affect				
Low	Reference	Reference	Reference	Reference
High	−7.07 (−26.78, 12.64)	0.37 (−0.004, 0.74)	12.28 (−6.82, 31.37)	3.75 (−1.10, 8.59)
Social well-being (*n* = 550)				
Social connections				
Low	Reference	Reference	Reference	Reference
High	−10.88 (−28.83, 7.08)	−0.05 (−0.38, 0.29)	17.60 (−1.31, 36.51)	1.70 (−3.10, 6.49)
Social support				
Low	Reference	Reference	Reference	Reference
High	−22.79 (−39.97, −5.62)	0.02 (−0.35, 0.38)	23.86 (4.91, 42.81)	−2.17 (−7.08, 2.73)
Social participation				
Low	Reference	Reference	Reference	Reference
High	−21.22 (−39.99, −2.44)	−0.10 (−0.46, 0.25)	25.37 (6.27, 44.47)	2.49 (−2.40, 7.38)

Note: CI = confidence interval; LPA = light physical activity; MVPA = moderate-to-vigorous physical activity; PA = physical activity; SB = sedentary behavior. *Z* scores for life satisfaction and positive and negative affect were dichotomized into low or high levels according to medians: 0.22 for life satisfaction, 0.23 for positive affect, and −0.30 for negative affect. *Z* scores for social connections, social support, and social participation were dichotomized into low or high levels in terms of median 0.06 for social connections, 0.09 for social support, and 0.002 for social participation. Models adjusted for daily wear time of the activPAL3, age, sex and education level, smoking status, alcohol consumption, body mass index, number of cardiovascular diseases, number of neuropsychiatric diseases, number of musculoskeletal diseases, chair stand test, and personality traits.

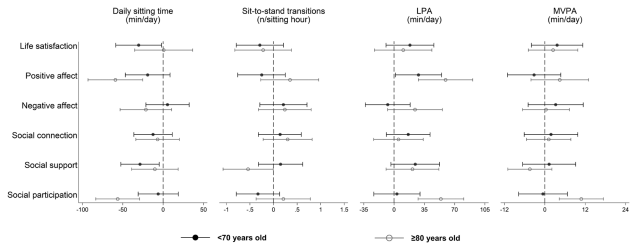

Figure 1. Beta coefficients and 95% confidence intervals for the correlations between subjective/social well-being and sedentary behavior/physical activity stratified by age (<70 and ≥80 years old). Reference groups were the lower levels of subjective and social well-being, dichotomized according to medians.

data from accelerometers, one study showed that PA was weakly associated with life satisfaction (37), while another study did not find such association (38). Also in line with our findings, previous studies found no significant associations between life satisfaction and SB (37,38).

Previous studies found that social network is positively associated with PA in older adults (39), while social isolation is correlated with reduced daily time spent in LPA and MVPA (40,41) and with increased daily sitting time (40). We did not find such an association for social connections in our study; the discrepancies may be explained by differences in measurement methods, study populations or, most likely, the specific domains of social connections being assessed. In agreement with our findings, most previous studies point to a positive association between social support and PA levels (42,43), although some studies did not find such an association, and studies investigating social support and SB have produced inconsistent results (44,45). As far as we are aware, no previous studies have examined the association between social participation and SB or PA in an older population.

Our results can be interpreted bidirectionally. The finding that participants with higher positive affect were more likely to sit less and move more could be explained by individuals with higher levels of subjective well-being being more likely to seek favorable life outcomes, thus having higher motivation to perform PA (13). Conversely, performing PA may also act as a stress buffer by reducing hypothalamic–pituitary–adrenal axis responses (16), which may lead to better mood and increased positive affect. Additionally, excessive SB has been shown to be associated with elevated levels of inflammatory markers, which may in turn result in worsened mood (46). The mechanisms through which social well-being may be correlated with SB or PA include social influence/social comparison, social control, role-based purpose and meaning, self-esteem, sense of control, belonging and companionship, and perceived support availability (15).

The stronger association of positive affect with daily sitting time and LPA found among the oldest old may be because older individuals tend to retain positive information better than negative information, which gives rise to better outcomes in decision making and deliberative problem solving (47). This may increase the chances of older subjects with higher levels of positive affect to take part in health-promoting activities such as regular exercise. The association of social participation with less sitting and longer time in LPA could be explained by the fact that many of the social activities included in our questionnaires (eg, going to a restaurant/pub/cafe, volunteer work, going to the cinema/theater/

concert, etc.) usually happen outside the home and require people to move to and from the meeting places and during the meetings (Supplementary Table 2). Furthermore, activities such as dancing, watching sport events, and travel include both social participation and PA. Consequently, people with mobility impairment may be less likely to participate in such activities. We also found that associations between social participation and both SB and PA were stronger in the older group, which could be partly due to the fact that self-enhancement from drawing social comparisons becomes more prominent with age (48).

There are several strengths to this study. Firstly, we used data from the SNAC-K study comprising a large, randomly selected cohort of older adults with data covering a wide range of clinical information and covariates including social demographic, and lifestyle- and mental health-related measures. Secondly, we assessed SB and PA from multiple dimensions obtained from thigh-worn accelerometers. This largely reduces the risk of recall/report bias associated with self-reported data and provides more comprehensive information. These measures are also more reliable and give more detailed information compared to the commonly used waist-worn accelerometers, as thigh-worn devices also record postural changes, such as transitions from sitting to standing. Lastly, we used several validated questionnaires to obtain information about participants' subjective and social well-being. By doing so, we were able not only to capture their perceptions of well-being holistically, but also to minimize the risk of measurement error caused by using single parameters.

Our study also needs to be interpreted considering several limitations. Firstly, this was a cross-sectional study which prevents us from determining the directionality and potential causality between exposures and outcomes. Secondly, we only examined SB and PA during a single period of 7 consecutive days, so variance over time was not considered. Thirdly, our study cohort lives in a relatively affluent region in Sweden compared to the general older adult population, which may limit the generalizability of our findings to other populations. In addition, in the ActivPal subsample, we excluded people with either severe cognitive impairment or not able to move indoors without assistance, leading to an even healthier sample than the general older population. Fourthly, most of the positive affect items (ie, active, inspired, determined, alert, or enthusiastic; see Supplementary Table 2) may already imply an activation and high levels of energy from the respondent. Therefore, there could be some slight circularity between positive affect and PA performance. However, we also used other measures of subjective well-being to mitigate this limitation. Lastly, we categorized all well-being variables using the median, which may lead to loss of information (49). The reasons for dichotomizing the variables were that the interpretation of results can be easier and more intuitive, since clinical decision making is often categorical in its nature, and that binary variables are less sensitive to departures from model assumptions.

In summary, improving positive affect, providing social support, and encouraging social participation may be helpful in reducing sitting time and increasing LPA in older adults. However, due to the cross-sectional nature of our study, it could also be that higher levels of LPA and spending less time sitting are predictors of better subjective and social well-being among older adults. Either pathway would be beneficial from a public health perspective, but future longitudinal studies are warranted to determine how exactly psychosocial well-being, SB and PA influence each other in older adults.

Supplementary Material

Supplementary data are available at *The Journals of Gerontology, Series A: Biological Sciences and Medical Sciences* online.

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Conflict of Interest

None declared.

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Author Contributions

S.C. carried out the main data analysis and drafted the manuscript. A.-K.W. originated the idea for this study. I.-M.D. managed the accelerometer data and generated the activity variables. A.-K.W., I.-M.D., A.C.-L., and M.S. have contributed to advising and interpreting results and revising the manuscript. All authors take full responsibility for and have read and approved this final version of this manuscript.

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