



Magnitude and Composition of Sedentary Behavior in Older Adults Living in a Retirement Community

Emerson Sebastião¹ · Joshua Pak¹ · David Benner Jr.¹ · Priscila M. Nakamura² · Camila B. Papini³

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Abstract

High amount of sedentary behavior (SB) has been associated with a multitude of adverse health events in older adults. There are limited data regarding SB in older adults living in retirement communities (RC). This study described the magnitude and composition of SB [non-screen sedentary time (NSST) and screen sedentary time (SST)] in older adults living in a RC and documented variation in this behavior as a function of demographic, health, health behavior and clinical variables. This cross sectional descriptive study enrolled and assessed 100 older males and females living a RC located in the Midwest region of United States. Participants completed a questionnaire for sample characterization and a SB questionnaire. Metric of SB (i.e., TST, NSST and SST) were analyzed overall and separated by the variables of interest. Participants reported on average 10 h/day of sedentary activity (65% on NSST and 35% on SST). Older adults reported to spend most of their awaking hours in activities such as reading, watching TV and computer use. Significant variations on NSST and SST were observed for gender, BMI, perceived health, mobility aid use and number of chronic diseases. These findings may help in the development of tailored strategies and interventions focusing on reducing SB in this particular under-researched subgroup.

Keywords Elderly · Health lifestyle · Senior living residence · Sitting time

Introduction

There is compelling evidence of the detrimental health effects of a physically inactive lifestyle in the older adult population [20]. Parallel, there is fast growing evidence suggesting prolonged periods of sedentary behavior (SB; i.e., mostly sitting) has emerged as a distinct risk factor (i.e., independent of achieving current physical activity recommendations [32]) for adverse health outcomes in different groups, including older adults [5, 19, 21]. Particularly in the older adult population, high amounts of sedentary time has been associated with decreased functional fitness and falls [16, 24], increased risk for developing chronic diseases [5, 8, 29] and high mortality rates [33]. A recent study further

demonstrated a positive significant association between sedentary time and total health care cost in old Chinese adults [36]. To this end, reducing SB among the older adult population is paramount as researchers demonstrated that this population spend significantly more time in such behavior compared to other subgroups [18].

Previous studies on SB have mostly been conducted in community-dwelling older adults and there are limited data regarding this behavior in those living in retirement communities (RC). This is important because 2010 data show that there was over 2000 RC in the United States with an estimate, of 640,000 residents [28] and the profile of these residents may have significant differences from those living in the community. Further, the dynamics of a RC is also a crucial point to be considered. Living in a RC may reduce the opportunity to be more physically active as several services and amenities are provided on site (e.g., cleaning, gardening) and therefore, potentially increasing sedentary time. Few studies have focused on SB in older adults living in RC [1, 16, 17]. Although engendering valuable information about sitting time/SB, these studies employed an objective measure of sedentary time (i.e., accelerometer) [1, 16]. Indeed, objective measures of SB mitigates several sources

✉ Emerson Sebastião
esebastiao@niu.edu

¹ Department of Kinesiology and Physical Education, Northern Illinois University, DeKalb, IL, USA

² Federal Institute of Education, Science and Technology, Muzambinho, MG, Brazil

³ Department of Sport Sciences, Federal University of Triângulo Mineiro, Uberaba, MG, Brazil

of bias inherent to self-report; however, these devices do not provide any information about specific behaviors (e.g., transportation, reading, TV watching). This is important because such information may help guide the development of tailored intervention studies aiming to reduce SB. One study combined self-report and objective measure of SB; however, it was conducted in Southern California, where residents can enjoy outdoor activities throughout the year [17] compared to other parts of the country such as the Midwest. The social and physical environments where people live are known to affect human movement behavior. Indeed, these factors exert an influence on the propensity to engage in physical activity as well as SB.

Due the limited information on SB in older adults living in RC, this study aimed to describe the magnitude and composition of total sedentary time (TST) [i.e., screen sedentary time (SST) and non-screen sedentary time (NSST)] in older adults living in a RC. The present study further aimed to document variations in TST, SST and NSST as a function of gender, body mass index, perceived health, mobility aid, chronic disease and exercise participation.

Materials and Methods

Study Design

This cross-sectional study was approved by the Northern Illinois University Institutional Review Board (IRB Protocol # HS18-0011) and all participants signed an informed consent before data collection.

Participants

Participants were recruited from a RC located in the Midwest area of United States. This RC offers four different types of living options: independent apartments, duplex living, personal care apartments and licensed healthcare (i.e., assistance needed 24 h). With the exception of licensed healthcare, all others residents are fully or partially independent. For the purpose of this study, only residents living in the independent apartments, duplex living, and personal care apartments were eligible to participate. Residents living at the licensed healthcare unit during data collection were excluded from the study because of their need for 24/7 care. At the time of data collection, the population of the referred RC was 236 residents aged 60 years and over. This number excluded those living in the licensed healthcare unit. Based on the target population of 236 residents, 5% of error, 95% confidence level and a homogeneous distribution, 146 residents would be needed to comprise a representative sample. However, due to funding constraints and refusal to participate in the study (13 residents; 9 females and 4 males) the

final sample size was comprised by 100 individuals aged 60 years and older.

Measures

Sedentary Behavior (SB)

SB behavior was measured using a questionnaire specifically developed for the older adult population [34]. Scores from this questionnaire were found to be moderately associated with scores from objective instruments (i.e., accelerometer; $r = .35$). The questionnaire further presented acceptable test–retest reliability (0.71) [34]. The questionnaire comprises ten questions related to time spent in different activities: napping, reading, listening to music, watching TV, computer, working, hobby, talking with friends, transportation and church/theater. For the purpose of this study, three metrics were calculated and expressed as minutes per day: (a) non-screen sedentary time (NSST), (b) screen sedentary time (SST) and, (c) total sedentary time (TST). NSST was calculated based on the sum of time spend in eight out of ten possible activities: napping, reading, listening to music, working, and hobby, talking with friends, transportation and church. SST was calculated based on the sum of time spend in two out of ten activities: watching TV and computer. TST was calculated based on the sum of time spend in NSST and SST.

Other Measures

A collection of demographic, health, health behavior, and clinical information were gathered using a questionnaire designed for the purpose of the study. Demographic variables included age, gender and ethnicity. Health and health behavior variables included: body mass index (calculated as weight in kilograms divided by height in meters squared) [14], physical activity level using the Physical Activity Scale for Elderly [9, 35], exercise participation (do you partake in the fitness program offered by the facility? Yes or No) and perceived health (would you say that in general your health is? Excellent, very good, good, fair and bad?). Clinical variables included: mobility aid (Yes/No), number of diagnosed chronic diseases (later dichotomized into 0–2 and ≥ 3) and number of prescribed and over the counter medication taken.

Procedures

All assessments (i.e., SB and questionnaires) were completed in a single session in the fitness center office located on the first floor of the RC. All questionnaires were administered by an experienced research staff and each participant took an average of 32 min to be assessed. At the fitness center office participants were first asked to read and sign

the informed consent. After signing the informed consent the research staff started administering the questionnaires, which were completed in the following order for all participants: SB, physical activity, demographic, health and clinical. Upon completion, participants received a modest cash compensation for their time. Data were collected from February to April of 2018.

Data Analysis

Data were analyzed using SPSS version 24 (IBM Corporation, Armonk, NY) and significance was set at $P < .05$. Kolmogorov Smirnov test of normality revealed that SB data were not normally distributed. To this end descriptive statistics (median and 25th–75th percentile) were used to display SB information. However, for better comparison with previous studies conducted in different populations, we further decided to report SB data in terms of mean and 95% confidence interval. *U*-Mann Whitney was also used to examine potential differences in metrics of SB (i.e., NSST, SST and TST) between gender, mobility aid, number of chronic diseases and exercise participation; and Kruskal–Wallis test for comparison between different categories of BMI (i.e., normal, overweight and obese) and perceived health (excellent/very good, good and fair).

Results

Detailed information on the sample demographics, health and health behavior and clinical characteristics is presented in Table 1. Briefly, the average age of the sample was approximately 85 (± 6.3) years with the majority being women. One hundred percent of the participants were Caucasian, on average overweight with about 42% perceiving their health as good. Over 70% of the sample did not make use of mobility aid to walk but reported to have multiple chronic diseases.

Figure 1 displays detailed information on the amount of time (i.e., percentage) spent in different SB for the entire sample. Overall, data demonstrated that activities such as watching TV and reading comprised nearly 45% of the TST in this population with values close to 26 and 19%, respectively. Computer use accounted for about 12% of their TST.

Table 2 displays information on TST separated by analyzed variables. Overall, our sample of older adults spent on average 10 h per day in sedentary activities. Those in the obese category, perceiving their health as excellent/very good, not making use of a mobility aid to walk and those reporting three or more chronic diseases reported significantly higher TST compared to their counterparts normal weight, perceiving their health as fair, who make use of an

Table 1 General characteristics of the sample

Variables	n = 100	p
Demographics		
Age (years)	84.7 (6.3)	–
Sex, male/female	30/70	< .001
Race, %Caucasians	100.0	–
Health and health behavior		
BMI (kg/m ²)	27.9 (5.9)	–
Physical activity, score	56.6 (42.6)	–
Fitness Program Participation (%)		> .05
Yes	57.0	
No	43.0	
Perceived health (%)		< .001
Excellent	12.1	
Very good	29.3	
Good	42.4	
Fair	16.2	
Clinical		
Mobility aid (%)		< .001
Yes	27.0	
No	73.0	
Number of chronic disease, %		< .001
0–2	31.0	
≥ 3	68.0	
Number of medication, mdn (IQR)		
Prescribed	4.0 (3.0)	–
Over the counter	2.0 (2.0)	–

All values are mean and standard deviation unless otherwise noted
BMI body mass index, *mdn* median, *IQR* interquartile range
P for Chi square test

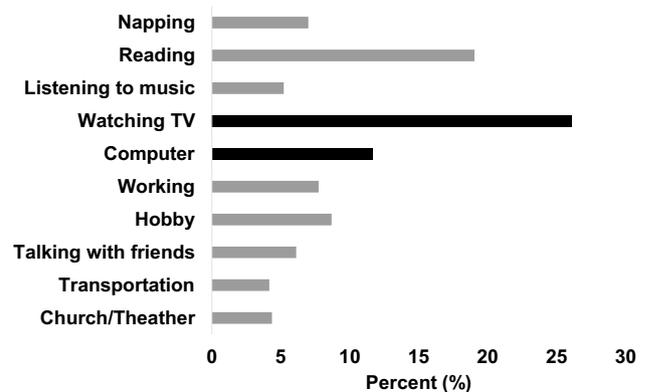


Fig. 1 Composition of TST in older adults living in a retirement community. Black bars represent screen type activities while gray bars represent non-screen activities

assistive device to walk and those reporting fewer chronic diseases.

Table 2 Descriptive analysis and respective comparison between groups for total sedentary time in older adults living in a retirement community separated by gender, body mass index, perceived health, mobility aid, number of chronic diseases and fitness program participation

Variables	N	%	Total sedentary time		P
			Mean (CI _{95%})	Median (25th–75th)	
Overall	100	100	600.2 (548.5–651.9)	542.5 (450.0–701.25)	
Gender					.436
Males	30	30	646.6 (510.2–783.1)	580.0 (463.7–723.7)	
Females	70	70	580.3 (532.6–628.0)	540.0 (448.7–678.7)	
BMI (kg/m ²)					.015
Normal	28	28	512.7 (471.7–553.7)	507.5 (428.7–590.0)	
Overweight	42	42	601.3 (532.3–670.3)	552.5 (465.0–751.2)	
Obese	25	25	731.8 (574.9–888.6)	675.0 (505.0–847.5)	
Perceived health					.025
Excellent	41	41	645.0 (539.7–750.3)	570.0 (465.0–712.5)	
Good	42	42	599.9 (544.6–655.2)	575.0 (467.5–727.5)	
Fair	16	16	483.1 (369.6–596.6)	432.5 (386.2–528.7)	
Mobility aid					.017
Yes	27	27	560.9 (409.4–712.5)	475.0 (405.0–600.0)	
No	73	73	614.7 (568.2–661.2)	585.0 (475.0–720.0)	
Chronic diseases					.024
0–2	31	31	571.4 (459.7–575.1)	505.0 (425.0–590.0)	
≥3	68	68	637.2 (566.7–707.7)	587.5 (470.0–742.5)	
Fitness program					.517
Yes	57	57	577.7 (520.7–634.7)	540.0 (442.5–700.0)	
No	43	43	630.0 (534.1–725.9)	590.0 (450.0–705.0)	

Total sedentary time information is provided in minutes per day

BMI body mass index

P for Mann–Whitney U test or Kruskal–Wallis test

Table 3 displays information on NSST separated by analyzed variables. Briefly, our sample of older adults spent on average 6.5 h per day in NSST activities. This corresponds to 65% of their TST. Similar to the finds observed for TST, those in the obese category of BMI, not making use of a mobility aid and those reporting three or more chronic diseases reported significantly higher NSST compared to their respective counterparts.

Table 4 displays information on SST separated by analyzed variables. Briefly, our sample of older adults spend on average 3.5 h per day in SST activities. This corresponded to 35% of their TST. Data show that males reported significantly higher amount of SST compared to females. No significant differences in SST was observed for body mass index, perceived health, mobility aid, number of chronic diseases and exercise participation between respective groups.

Figure 2 displays detailed information of the amount of time (i.e., in percentage) spent in different sedentary activities separated by gender, body mass index, perceived health, mobility aid, number of chronic diseases and exercise participation. Briefly, activities such reading, watching TV and computer use are those where older adults appears to spend most of their time, regardless how the data is analyzed.

Gender

Significant differences in terms of the percentage of time spent for every activity assessed were observed between genders. Females spent 13.65% of their TST using computers compared to 6.92% of males ($P = .005$) but males were found to spend 11.67% of their TST in hobby activities compared to 7.4% of females ($P = .046$). No significant differences were observed for all other activities assessed ($P > .05$).

Body Mass Index

Detailed analysis demonstrated significant differences among categories of BMI in the percentage of time spent in napping (normal: 10.3%, overweight: 4.5%, obese: 8.1%; $P < .001$); with the overweight group representing with lower time compared to the normal and obese. Differences were also found for working (normal: 4.3%, overweight: 10%, obese: 8.1%; $P = .011$) with the normal group presenting with lower time compared to the overweight and obese; talking with friends and family (normal: 3.2%, overweight: 8.3%, obese: 6.9%; $P < .006$) with the normal group presenting with lower time than the overweight but similar to the obese.

Table 3 Descriptive analysis and respective comparison between groups for non-screen sedentary time in older adults living in a retirement community separated by gender, body mass index, perceived health, mobility aid, number of chronic diseases and fitness program participation

Variables	N	%	Non-screen sedentary time		P
			Mean (CI _{95%})	Median (25th–75th)	
Overall	100	100	389.5 (354.3–424.7)	360.0 (275.0–480.0)	
Gender					.547
Males	30	30	378.3 (310.4–446.2)	320.0 (243.7–486.2)	
Females	70	70	394.3 (352.2–436.4)	360.0 (283.7–468.7)	
BMI (kg/m ²)					.008
Normal	28	28	314.5 (281.1–347.8)	305.0 (267.5–367.5)	
Overweight	42	42	399.0 (342.1–455.9)	375.0 (265.0–482.5)	
Obese	25	25	478.4 (391.1–565.7)	440.0 (300.0–577.5)	
Perceived health					.073
Excellent	41	41	416.7 (353.4–479.9)	360.0 (300.0–480.0)	
Good	42	42	395.2 (347.0–443.4)	367.5 (275.0–490.0)	
Fair	16	16	309.4 (223.5–395.2)	272.5 (192.5–387.5)	
Mobility aid					.038
Yes	27	27	339.1 (267.4–410.8)	285.0 (220.0–420.0)	
No	73	73	408.2 (367.7–448.7)	360.0 (297.5–482.5)	
Chronic diseases					.013
0–2	31	31	329.5 (281.0–378.0)	300.0 (265.0–370.0)	
≥3	68	68	417.9 (371.9–463.9)	395.0 (286.2–490.0)	
Fitness program					.824
Yes	57	57	390.3 (340.0–440.5)	360.0 (265.0–482.5)	
No	43	43	388.6 (338.7–438.5)	360.0 (280.0–480.0)	

Non-screen sedentary time information is provided in minutes per day

BMI body mass index

P for Mann–Whitney U test or Kruskal–Wallis test

Perceived Health

No significant differences among the categories of perceived health (i.e., excellent/very good, good and fair) were observed in terms of the percentage of time spent in the different sedentary activities assessed.

Mobility Aid

The data further revealed that older adults not requiring a mobility aid to walk spent 5.03% of their total sedentary time in church/theater compared 2.56% of those who do require a mobility aid ($P = .022$). No significant differences were observed for all other activities assessed ($P > .05$).

Number of Chronic Diseases

It was observed that those reporting 0–2 chronic diseases spend 7.77% of their TST listening to music compared to 4.12% of those reporting ≥ 3 or more conditions ($P = .033$); but those reporting ≥ 3 chronic diseases report spent 7.12% of their TST talking with friends/family over the

phone compared to 3.8% of those reporting 0–2 conditions ($P = .010$). No significant differences were observed for all other activities assessed ($P > .05$).

Exercise Program Participation

In our sample, older adults participating in the exercise program offered by the facility reported spending 5.73% of their TST in church/theater compared to 2.57% of those who does not participate in the program ($P = .036$). No significant differences were observed for all other activities assessed ($P > .05$).

Discussion

This study demonstrated that older adults living in a RC reported spend high amounts of their awaking time engaged in SB indicating TV watching and reading as the most prevalent activities. Differences in TST, NSST, and SST according to sex, BMI categories, mobility aid and chronic diseases were further observed. During the last decade, SB has emerged as new health risk and as a new public health challenge. In fact, SB has been found to be an independent risk

Table 4 Descriptive analysis for screen sedentary time in older adults living in a retirement community separated by gender, body mass index, perceived health, mobility aid, number of chronic diseases and fitness program participation

Variables	N	%	Screen sedentary time		P
			Mean (CI _{95%})	Median (25th–75th)	
Overall	100	100	210.6 (181.2–240.1)	180.0 (136.2–270.0)	
Gender					.031
Males	30	30	268.3 (185.1–351.6)	240.0 (147.5–330.0)	
Females	70	70	185.9 (163.8–208.0)	180.0 (120.0–240.0)	
BMI (kg/m ²)					.889
Normal	28	28	198.2 (167.5–228.9)	202.5 (142.5–240.0)	
Overweight	42	42	202.3 (170.9–233.6)	180.0 (135.0–300.0)	
Obese	25	25	253.4 (150.9–355.9)	195.0 (120.0–307.5)	
Perceived health					.462
Excellent	41	41	228.3 (164.6–291.9)	195.0 (120.0–285.0)	
Good	42	42	204.6 (176.9–232.4)	180.0 (150.0–245.0)	
Fair	16	16	173.7 (116.5–230.9)	157.5 (120.0–262.5)	
Mobility aid					.374
Yes	27	27	221.8 (126.5–317.1)	180.0 (120.0–240.0)	
No	73	73	206.5 (184.1–228.9)	180.0 (140.0–270.0)	
Chronic diseases					.451
0–2	31	31	187.9 (154.3–221.5)	180.0 (140.0–240.0)	
≥3	68	68	219.3 (178.6–259.9)	180.0 (123.7–270.0)	
Fitness program					.178
Yes	57	57	187.4 (162.1–212.8)	180.0 (145.0–250.0)	
No	43	43	241.4 (181.4–301.3)	240.0 (120.0–300.0)	

Screen sedentary time information is provided in minutes per day

BMI body mass index

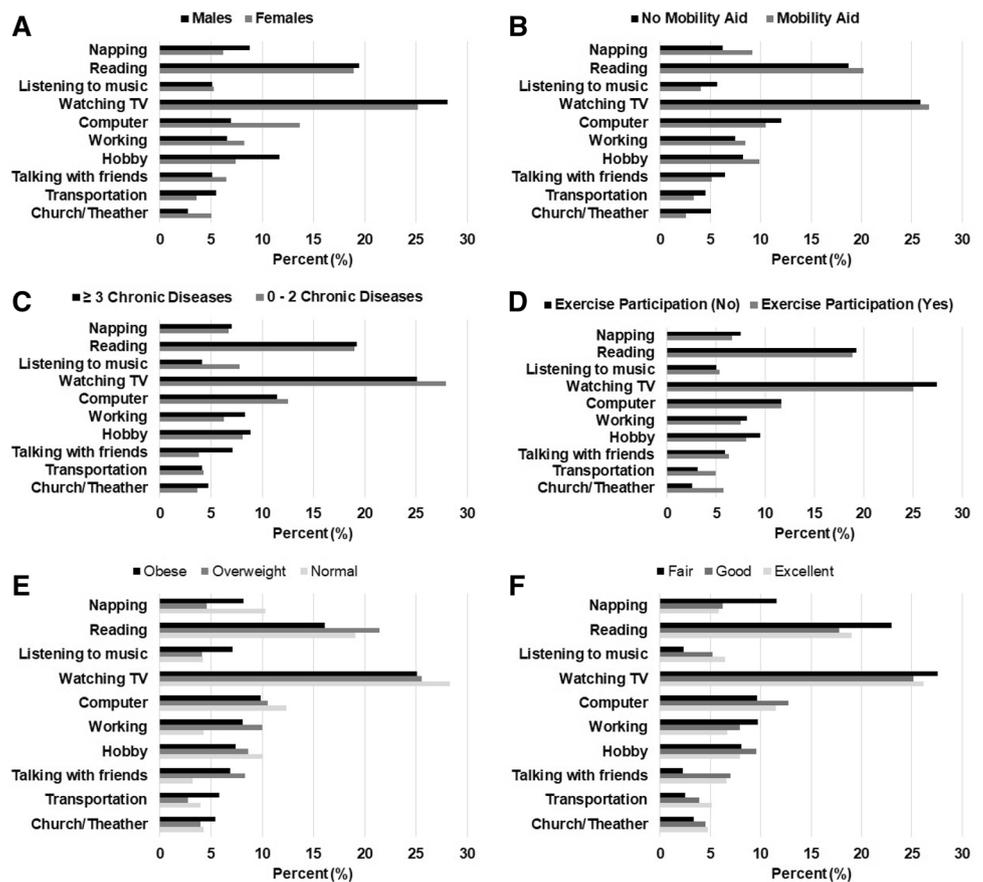
P for Mann–Whitney U test or Kruskal–Wallis test

factor for morbidity and mortality independent of achieving current PA recommendation [21, 25]. There is evidence showing that older adults seem to be a group at higher risk for adverse health outcomes for large amounts of SB and low levels of PA [11, 22]. Thus, investigating SB in RC is paramount because such settings are critical to healthy aging and quality of life. Further, RC may be appropriate environments for scalable health interventions.

During the last decade, SB has emerged as new health risk and as a new public health challenge. This is because SB was found to be an independent risk factor for morbidity and mortality regardless of achieving current physical activity recommendation [21, 25]. Several factors including but not limited to technology and re-engineering of physical spaces have contributed to increase the amount of time human beings are exposed to SB. However, it appears that older adults are a group at higher risk for adverse health outcomes for large amounts of SB and low levels of physical activity [10, 11, 22, 31]. Our results demonstrated that older adults living in a RC spend on average 10 h per day in sedentary activities; with 6.5 in NSST and 3.5 h in SST (65% and 35%, respectively). This corroborate findings from previous studies conducted with community dwelling older adults. For instance, researchers have demonstrated that the

average sedentary time reported by older adults living in the community range from 8.5 to 10.7 h per day [10, 11]. Parallel, Leask et al. [15] observed that nearly 64 and 36% of the TST of their participants were accumulated through NSST and SST, respectively. However, others have observed slightly different values for SST (53%) [10]. A better understanding on how SB is accumulated can inform intervention strategies. For instance, the finding that 65% (i.e., 6.5 h) of the TST is accumulated in NSST and 35% (i.e., 3.5 h) in SST and that the most reported sedentary activities were TV watching and reading suggest that interventions should focus on reducing the time exposed to those activities and/or focus on the importance of breaking prolonged periods of sedentary time. In fact, TV viewing has been associated with increased risk of limitations in physical function and mortality in older adults [4, 13]. By contrast, daily breaks in sedentary time has been associated with better abdominal obesity profile in this population [12]. Although there is no recommendation on the maximal allowable time of prolonged sitting time (proxy of SB) to avoid adverse health events, there is preliminary evidence suggesting that sitting for 20 min consecutively negatively impacts cardiometabolic health [3]. Interventions focusing on reducing SB in older adults have shown to be promising. One study examined the

Fig. 2 Composition of total sedentary time in older adults living in a retirement community separated by gender (a), mobility aid (b), number of chronic diseases (c), exercise participation (d), body mass index (e) and perceived health (f). Watching TV and computer are screen time activities and all other are non-screen time activities



feasibility and preliminary effects of sedentary time reduction intervention in overweight and obese older adults [23]. The authors found the intervention to be feasible and acceptable with preliminary evidence of effectiveness.

This study further demonstrated variations in TST, NSST (total and per activity) and SST (total and per activity) as a function of gender, body mass index, perceived health, mobility aid, chronic disease but no differences in these sedentary metrics in terms of participation in the exercise program. These findings partially corroborated the results observed by researchers investigating factors associated with physical activity and SB in older adults from six low and middle income countries [6]. Overall, the authors observed that demographic, health and health risk variables were associated with higher sedentary time. However, methodological differences in terms of how the dependent variables (sedentary time) were computed and analyzed, limits the comparison between studies. We observed a significant difference in SST between genders with females reporting significantly less time in SST compared to males; however, it is important to note that no significant differences were observed for TST and NSST between genders in our study. Some studies suggest that SB (i.e., total) may be influenced by gender but the literature shows equivocal findings [2, 7, 11, 16, 24]. We further observed that those not making use

of a mobility aid and those reporting three or more chronic diseases also reported significantly higher TST compared to their counterparts who make use of an assistive device to walk and those reporting less chronic diseases. Contrary to our findings, researchers examining SB in older adults at assisted living facility observed that those using mobility aids were more likely to present with higher sedentary time compared to those who do not [16]. This could be partially explained by the difference between the proportions of old adults who use a mobility aid to walk. In our study, 27% make use of mobility aid compared to 72% in their study. Further, both studies employed a cross-sectional design, which makes it difficult to establish a cause-effect relationship between SB and use of mobility aid. Nevertheless, it is important to note that older adults in the referred study using a mobility aid were found to spend similar TST as ours. Chronic diseases were found to impact sedentary time in our study. Those reporting ≥ 3 chronic diseases reported higher TST and NSST compared to those reporting < 3 . This does not corroborate findings from previous studies conducted in older Brazilian adults where the authors observed that older adults reporting ≥ 2 chronic diseases report similar TST compared to those reporting zero or one chronic disease [27]. The mixed findings can be partially explained by the organization of the chronic disease as an independent

variable. Higher BMI values were further associated with higher TST and NSST in our sample but there was no significant difference in terms of SST. Researchers have observed similar findings when taking into consideration TST. For instance, a study assessing over 300 older adults observed those reporting more than 3 h per day of sitting were found to have higher BMI values [26]. Taken together, these findings suggested that several demographic, health and health behavior as well as clinical variables presented variations in metrics of sedentary time (i.e., TST, NSST and SST) and should be taken into consideration when strategies and or interventions are put in place to reduce this behavior.

Key strengths of this study were the use of a questionnaire that allowed us to compute not only TST but also other important metrics of SB (i.e., NSST and SST) that provides a better understanding of the behavior. Further strengths included the use of a sample/group that has not been extensively studied in terms of SB (i.e., older adults living in a RC) and the fact that all interviews were conducted by the same person using a face-to-face approach. This appears to be more appropriate for older adults because it provides a possibility for discussing potential ambiguities, misunderstandings or other issues with the interviewer. This study has some limitations. Our convenience sample was selected from one RC located in the Midwest region of United States (i.e., Illinois). Thus, we do not know if similar findings would be observed in RC from different states such as Florida, a place that a significant amount of older adults chose to retire because of the weather. Moreover, our sample was not a representative sample of the evaluated RC. However, due to the homogeneity of the population (e.g., 100% Caucasian) it is unlikely that assessing more participants would change the results. Nevertheless, generalization of the results must be conservative. Another limitation relates to the self-report assessment of SB, which is known for underestimating actual values of SB compared to objective measures (i.e., accelerometers) [11]. Despite the limitations, we were able to engender valuable information concerning the composition and magnitude of SB in older adults living in a RC that may help in the development of strategies and interventions focusing on SB reduction. Additionally, the observed results are indicative of the need for future investigations examining determinants of SB in older adults living in RC.

Conclusion

Our findings demonstrated that older adults living in a RC report to spend on average 10 h per day in sedentary activities being 65% on NSST and 35% on SST. Our sample of older adults reported to spent most of their awaking hours on activities such reading, watching TV and computer use. Significant variations on TST, NSST and SST were observed for

gender, BMI, perceived health, mobility aid use and number of chronic diseases. The number of RC is expected to continue increase, given the rapidly growing ageing population [30]. As previously mentioned, RC are important settings to promote healthy aging and quality of life, as they are suitable environments for scalable health interventions. Although all participants of present study have the opportunity to engaged in an exercise program offered by the RC, almost half (43%) reported not being enrolled in the program. However, it is important to highlight that SB is a risk factor for detrimental health independent to physical activity. Thus, strategies promoting physical activity should also encourage older adults to decrease sedentary behavior.

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Compliance with Ethical Standards

Conflict of interest The authors declare no conflict of interest.

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