ACUTE CHANGES IN PHYSICAL ACTIVITY ASSOCIATED WITH HOME CONFINEMENT DUE TO COVID-19: A RETROSPECTIVE CROSS-SECTIONAL STUDY IN A COLLEGIATE POPULATION IN GREECE

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Abstract:

Background: In March 2020 home confinement was imposed to Greek residents as a measure to abate the COVID-19 pandemic. This study aims to elucidate changes in physical activity (PA) levels that occurred during confinement in a collegiate population in Greece. **Methods:** 565 collegiate students and staff participated in a retrospective cross-sectional online survey measuring PA related behaviours before and during the confinement period using the International Physical Activity Questionnaire Short Form (IPAQ-SF). **Results:** The overall activity (IPAQ-SF MET-min score) decreased in the confinement- compared to the pre-confinement period [Md (Q1:Q3) pre vs. during: 2464 (1160; 5126) vs. 2247 (1074; 3999), p<0.001], driven exclusively by males (p<0.001) and the younger age group (18-31 years; p=0.003). Sitting increased in the total sample, including in each gender and age-group (all p<0.001). Compared to pre-confinement period, during confinement the odds of being in the 'medium' or 'high' moderate- to- vigorous PA group were 41% higher in females (aOR = 1.41, 95% CI=1.11-1.80, p=0.006) and 33% lower in

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males (aOR=0.67, 95% CI=0.50-0.88, p=0.005). **Conclusion:** There is a gendered pattern in observed changes in PA during the Covid-19 home confinement in the collegiate population, with females being those favored in comparison to males.

1. Introduction

In March 2020, the World Health Organization (WHO) characterized COVID-19 as a pandemic.[1] Public health authorities around the world enforced measures and restrictions in order to contain the rate of infection. Most governments implemented nationwide lockdowns which forced people in social isolation and home confinement. Schools and Universities worldwide shut down for a long period of time and experienced a dramatic change in the mode of operation as all teaching was delivered online. In Greece, educational entities were forced to close their facilities on March 11, 2020, while on March 23 home confinement was imposed affecting the entire population. People could only leave house in order to buy supplies or meet basic needs, including outdoor physical activity, after informing the authorities with written movement permission documentation or a specific cellphone message.

An inevitable consequence of these strategies was the limited opportunities for participation in normal daily activities related to work, education, leisure time and several modes of exercise.[2] However, it is well established that decreased rates of daily physical activity (PA) and exercise are highly correlated with the development of chronic diseases and mortality.[3, 4] Moreover, increased sitting time is another independent predictor of adverse health outcomes[5, 6, 7] while participation in at least light or moderate PA is highly correlated with increased immunity, health indices and healthy body mass.[5,6,8] Apart from reduced movement concerns, it is reasonable to confer that public health is further challenged under such circumstances by differing eating patterns that might further compromise energy balance and subsequently body mass and metabolic health.[9, 10]

Despite the health benefits that PA and particularly moderate and vigorous PA can confer,[5] prevalence of physical inactivity in adults remains unaltered during the last decade.[11] WHO had previously reported that in 2016, the global prevalence of insufficient physical activity was 27,5% on average with the percentage being more than 8 points lower in the male compared to the female population.[11] According to Eurobarometer[12] 68% of the Greek population reported that they do not exercise or play a sport, 68% never do vigorous exercise, 52% never participate in moderate PA and 15% never walk. Women in Europe are less likely than men to do moderate (32% vs 37%) or vigorous (35% vs 50%) exercise of more than an hour per week. A difference of 4% was also reported by age, with younger individuals in Europe (aged 15-24) participating less in vigorous PA of more than an hour compared to older individuals (aged 40-54). Finally, the highest percentage of those who exercise (40%) report they do it in informal settings, such as parks.[12]

In light of these findings it is clear that unless we find ways to maintain activity under restrictions and develop opportunities in order to foster a more active lifestyle, the current pandemic will exacerbate the problem of sedentarism and related comorbidities.[2,6] Indeed, current evidence indicates that populations in different regions have faced difficulties maintaining at least the same levels of PA during home confinement.[13, 14, 15, 16, 17, 18, 19] As we have already entered an era of constant vigilance for the case of COVID-19, it is important to investigate the behavioural lifestyle responses of different populations in different settings in face of restrictions imposed by authorities around the globe. This knowledge may help draw some early conclusions in order to inform PA recommendations under confinement periods. Particularly educational communities are facing the challenge of long-lasting changes in their operational system as staff and students are nowadays minimally involved into face-to-face teaching. Against this backdrop, the aim of the present study is to assess whether overall PA and its components have been affected during a lengthy home confinement period in an educational community with a structured daily program while accounting for factors such as gender, age and perceived safety in the local area that are known to have differential effects on PA.

2. Materials & Methods

2.1 Study design and participants
Data were drawn from the first wave of a wider cross-sectional online survey entitled "Taseis/Trends 2020" focusing on physical activity, diet and eating patterns, and psychosocial quality of life in the collegiate community. Participants were recruited from the four main campuses of Metropolitan College in the two largest cities of Greece (Athens and Thessaloniki), counting approximately 6000 students in undergraduate and postgraduate courses and 500 employees. A total of 596 members of the collegiate community completed the survey questionnaire. All participants were aged 18 years or older. The study was designed and conducted in line with the principles of the Declaration of Helsinki. The protocol and the survey were approved by the Metropolitan College Ethics Committee.

2.2 Procedure
The survey was uploaded and shared on the e-Surv online survey platform (https://esurv.org/) in Greek and was distributed via mass e-mails and the Moodle learning platform as a message on the main page. The survey included an introductory page describing the background and the aims of the survey, contact details of the principal investigator and ethics information for participants. Participants were informed on the length and the time needed to complete the survey and were instructed that by completing the survey they were consenting to participate anonymously in the study. Data collection was held during the confinement period in Greece, between April 6 and

May 3, 2020. During that period people were only able to leave house for basic needs among which was physical activity.

2.3 Measures
2.3.1 Physical activity / inactivity

The International Physical Activity Questionnaire Short Form (IPAQ-SF)[20] was used for the assessment of PA, including the calculation of IPAQ-SF MET-min score, total moderate-to-vigorous physical activity [MVPA (min/week)] and sitting time (minutes per typical day). Each item of the IPAQ that measured past-7-days PA was followed by a clause measuring the same variable in the period immediately before home confinement. Reliability of the questionnaire was piloted by the project steering group prior to survey administration. Based on their responses, participants were grouped as 'Inactive,' 'Minimally active,' or 'Health enhancing physical activity (HEPA) active' (as per IPAQ Scoring Protocol)[21] and as undertaking 'low' (≤ 150 min/week), 'medium' (>150 but ≤ 300 min/week) or 'high' (>300 min/week) MVPA (as per recommendations).[22,23] Finally, based on the data on sitting time, a new categorical variable was created consisting of three categories: 'increased' (for any increase in sitting time of 30 or more minutes in the confinement- compared to the pre-confinement period), 'decreased' (for any decrease in sitting time of 30 or more minutes), and 'stable' sitting time (for any difference in sitting time of less than 30 minutes).

2.3.2 Other covariates

Gender was measured in binary format (male/female). Age and weight were measured through self-reports recorded in open-ended questions. In the case of weight, a new categorical variable was created consisting of three categories: 'weight gain' and 'weight loss' (for any increase or decrease, respectively, of more than one kg in weight in the confinement compared to the pre-confinement period), and 'stable weight' (else). Participants were asked to respond about how much they agreed or disagreed with the following statement: "Where I live, I feel safe to walk around the area when it gets dark" and responses were collapsed into two categories: 'Sense of security' (Totally agree/Somewhat agree) and 'Sense of insecurity' (Neither agree, nor disagree/Somewhat disagree/Totally disagree).

2.4 Statistical analyses

Descriptive statistics including median and quartiles for continuous variables and frequency as count and percentage for categorical variables were calculated. Wilcoxon signed ranks test was used to assess significant changes in the IPAQ-SF score, MVPA, walking and sitting time, and weight and the McNemar-Bowker test to identify significant changes across the three IPAQ-SF and MVPA groups between the two periods. These analyses were conducted for the total sample and separately for gender and age group. A Generalized Linear Model was used to investigate the odds of being in the 'medium' or 'high' MVPA groups. The model used MVPA group as the dependent variable (ordinal,

with three categories, assigning 'low' as reference category), while also accounted for the likely effect of the following factors: time, gender, age group, change in weight and sitting time in the confinement- compared to the pre-confinement period and perceived sense of security of being outdoors in residential area. The interaction of gender and age group by time and the interaction of weight- and sitting change and perceived sense of security of being outdoors in residential area by gender was also included in the model. Time was included also as a within subject factor. For those significantly associated with the dependent variable (i.e. time by gender and sitting time change by gender) two dummy variables were created for the presentation of each factor: one for males and one for females. Level of significance was set at $\alpha=0.05$. Analyses were conducted using SPSS Statistics for Windows (Ver. 25.0, Armonk, NY: IBM Corp).

3. Results

A total of 565 individual cases were included in the dataset that were mostly females (66.7%), college students (83.6%) and in the age group of 18-30 (75.4%), with a median age 22 years (IQR=10; Table 1).

3.1 IPAQ-SF
MET—In the total sample, there was a significant 217-point decrease in the median IPAQ-SF MET-min score in the confinement- compared to pre-confinement period [Md (Q1, Q3) pre vs. during confinement: 2464 (1160, 5126) vs. 2247 (1074, 3999), p<0.001; Table 2]. Significant decreases were observed primarily in men (p<0.001) and the younger age group (p=0.003).
Groups—In the pre-confinement period, more than half (52.6%) of the total sample belonged to the 'HEPA active,' one third (32.5%) to the 'minimally active,' and one in 7 (14.9%) to the 'inactive' IPAQ-SF group (Table 3). The corresponding rates were not significantly different in the period during the confinement (p=0.423). As shown in Table 3, significant changes in groups' proportions were observed only in males. Specifically, in the pre-confinement period, 65.2% belonged to the 'HEPA active,' 21.8% to the 'minimally active,' and 13.0% to the 'inactive' group. During confinement: 6.2% moved from the 'inactive' to either the 'minimally-' or the 'HEPA active' group; 5.6% moved from the 'minimally active' to the 'HEPA active' but another 5.0% to the 'inactive' group; and importantly 24.9% of the 'HEPA active' group moved down to either the 'minimally active' or 'inactive' group, overall suggesting increases in the proportion of the latter two groups at the expense of the 'HEPA active' group (p=0.003; Table 3).

3.2 MVPA
Minutes—In the total sample, there was a non-significant 10-minute increase in the median MVPA score in confinement- compared to pre-confinement period [Md (Q1; Q3) pre vs. during confinement: 240 (90, 540) vs. 250 (105, 480), p=0.713; Table 2]. However, significant decrease was observed in males [Md (Q1; Q3) pre vs. during confinement: 328

(109, 658) vs. 245 (100, 521), p<0.016)] and significant increase in females [Md (Q1; Q3) pre vs. during confinement: 210 (70, 480) vs. 248 (110, 480), p=0.039; Table 2).

Groups—In the pre-confinement period, more than two-fifths (42.7%) of the total sample belonged to the 'high', more than two-thirds (37.4%) in the 'low', and one-fifth (19.9%) to the 'medium' MVPA group (Table 3). The corresponding rates were not significantly different in the period during the confinement (p=0.731). As the data in Table 3 suggest, significant changes in groups' proportions were observed only in the two genders, also with different directions. Specifically, in males, in the pre-confinement period, 52.4% belonged to the 'high,' 29.8% the 'low,' and 17.9% the 'medium' MVPA group. During confinement: 7.1% of the 'low' MVPA group moved to either the 'medium' or 'high' group; 5.4% of the 'medium' group moved to the 'high,' but another 6.0% to the 'low' MVPA group; and importantly 20.8% of the 'high' group moved to either the 'medium' or 'low' MVPA group, overall suggesting increases in the proportion of the 'low' and 'medium' at the expense of the 'high' MVPA group (p=0.029; Table 3). In females, in the pre-confinement period, 37.7% belonged to the 'high,' 41.3% to the 'low,' and 21.0% to the 'medium' MVPA group (Table 3). During confinement: 13.2% the 'high' MVPA group moved down to either the 'medium' or the 'low' MVPA group; 6.3% of the 'medium' group moved down to the 'low,' but another 9.9% moved up to the 'high' group; and importantly 20.1% of the 'low' MVPA group moved up to either the 'medium' or (mostly) the 'high' MVPA group, overall suggesting increases in the in the proportion of the latter two groups at the expense of the 'low' MVPA group (p=0.046, Table 3).

3.3 Walking time

There was a significant 60-minutes decrease in the median walking time in the confinement- compared to the pre-confinement period in the total sample [Md (Q1; Q3) pre vs. during confinement: 210 (100, 420) vs. 150 (60, 360), p<0.001; Table 2]. Decreases characterised equally both gender and age group (all p<0.001, except for the group of 31+ years, p=0.012).

3.4 Sitting time

In the total sample, there was a significant 120-minutes increase in the median sitting time in confinement- compared to pre-confinement period [Md (Q1, Q3) pre vs. during confinement: 180 (60, 310) vs. 300 (120, 500), p<0.001; Table 2]. Significant increases were observed in both gender and age group (all p<0.001).

3.5 Weight

No significant changes were observed in the median weight between periods or genders (Table 2). Between the age groups, a significant change was observed in the older group, suggesting weight gain during confinement [Md (Q1; Q3) pre vs. during confinement: 71 (59, 85) vs. 71 (60, 86), p=0.012].

3.6 Multivariable model

Analysis examining the odds of being in the medium or high MVPA groups, while controlling inter alia for time period, gender, age group, sense of security for being outdoors in the residential area and change in weight and sitting time are presented in Table 4. The odds of moving up from the 'low' to any of the 'medium' or the 'high' MVPA group in the confinement- compared to the pre-confinement period were 41% higher for females (aOR=1.41, 95% CI=1.11-1.80, p=0.006) and 33% lower for males (aOR=0.67, 95% CI=0.50-0.88, p=0.005).

4. Discussion

The present study examined the impact of the lockdown on different measures of PA in a collegiate community sample in Greece. It found an overall worsening trend in PA, in that, both the IPAQ-SF score and walking time decreased, while sitting time increased. That trend was observed in the entire sample but also in males and the two age groups (18-30 and 30+). The only exception was females: in that group, the IPAQ-SF score did not change during confinement but the MVPA score increased. Notably, as multivariate analysis indicated, although males had 33% lower odds of being in the 'medium' or 'high' MVPA groups during confinement compared to the pre-confinement period, for females the odds were 41% higher. These findings suggest that there may be a gendered pattern in the effect of forced home confinement on PA in the population and warrant a gender-informed approach when designing interventions that aim to increase PA during crises.

The overall worsening trend in PA observed in the present study is in line with what most of emerging evidence in the field has highlighted.[13,14 15 16 17 18 19] Sharp reductions in PA were the logical consequence under conditions of enforcement of strict measures that explicitly aim to limit the movement of individuals. And, indeed, this has been the case with Greece, a country which has been relatively quick to adopt aggressive national lockdown strategies in spring 2020[24] also with its population being heavily exposed to news about its neighboring country, Italy, excess mortality due to COVID-19. And, contrariwise, studies which provide counterintuitive findings, that is increases in the frequency in some types of training in the population, have been conducted in countries (e.g., Australia, Italy, and Slovenia)[10, 16, 25] which have adopted relatively linier responses towards population mobility,[24] suggesting that there is a dose-response relationship between stringency in measures and PA change.

Decreasing PA trends during the COVID-19 pandemic have been evident despite the concurrent upsurge in many countries in expert and policy recommendations that urged population to maintain (if not increase) PA levels during the pandemic[25]—also as a protective measure against morbidity due to infection. Such recommendations, couples with individually held health-promoting motives and the proliferation of ideas for alternative and safe ways of indoor or outdoor exercise[18, 19] may be considered to have opened up an opportunity for keeping up with former physical activity levels in some people. In the present study, that opportunity seems to have been taken up only by

females. True, in line with numerus other studies[11,26] females in our study have consistently exhibited lower levels of activity than males—both before and during confinement. However, what has been distinctive in our findings is that only in females there was a significant increase in PA (as expressed by the MVPA score) in the confinement- compared to the pre-confinement period. Notably, the large gap that was evident in the proportion of the 'high' MVPA group between the genders before confinement was extinguished during the confinement period.

Contrary to our findings, at least two other studies (in China and Australia) have shown that women participated in less and lower intensity PA than men during restrictions.[14,15] Although we lack vital insight that could help understanding the reasons behind the favorable change in PA among women in our sample, it can be speculated that socio-cultural conditions that are unique to Greece may have helped to set a window of opportunity in this particular population for getting involved in more exercise during the lockdown. Although, individual motives (pertaining to e.g., health concerns and body image) cannot be excluded, in this population, distance work or study and changed routines may have lifted some burden from their daily commitments allowing for more leisure time for activity and exercise. As a result, differently to males, females in the present study seem to have taken advantage of the confinement period and increased activity and specifically time spent in exercise and possibly also intensity, as time spent in walking was decreased.

Risk of COVID-19 infection and associated morbidity and mortality has been consistently associated with older age.[27] It was therefore expected that during the lockdown older individuals would seek more isolation and -as an unintended consequence- adopt take on more sedentary behavior than their younger counterparts. In our study, PA (IPAQ-SF score) was indeed decreased, but change reached statistical significance only in the younger group (although, a trend was observed in the 30+ group). Walking was also decreased and sitting increased, but equally between the age groups, while no changes were observed in MVPA in either group. Although counterintuitive, these findings are of no surprise given that the sample in our survey consisted of primarily young adults, with 22 median age and 50% of them being between 20 and 30. The decreases in PA in the younger group may be associated with the fact that the lockdown has forced young people to move in with family members[28] thereby distracting their hitherto PA routines while also increasing their overall screen time. Similar to our study, a study in China showed that although PA in all age groups was decreased during lockdowns, young adults aged 20–34 years had the highest prevalence of insufficient PA, with that trend explained by the concurrent increase in screen time in this group.[14] Another study on University students found a reduction in walking time[29] while other data show younger individuals participating in more sedentary time than older Australians during quarantine.[15]

Of note, despite that the overall levels of PA decreased, self-reported weight remained stable, in the entire sample and in both genders. An increase of +0.5 kg in the 31+ age group is considered minimal. Inter-individual variability in behavioral responses

regarding energy intake and PA as well as either a correction in energy intake or misreporting of the actual values could account for these findings.[30, 31] Frequently, also changes in weight are not recognized in the short term[32] and combined with the potential for lower levels of PA, could lead to a positive energy balance and weight gain.[9] MVPA apart from being the most important PA component with relevance to health[5] is a standard component of lifestyle interventions for obesity treatment[33] and there is ample evidence that > 200 min/week is associated with improved long-term weight loss.[23, 34, 35] As nearly 2/3 of the sample in this study adequately engaged in MVPA either before or during restrictions, this might explain maintenance of body weight during quarantine.

The findings of this study should be seen in light of several limitations. Three are highlighted here. First, the survey was designed for online completion and participation was voluntary resulting in an overall low participation, despite the two rounds of reminders. Although the relationship between response rate and response bias in surveys is contested[36] and despite that the target population of the study consisted on a homogeneous group, its low response rate may have introduced bias, resulting in findings that may misrepresent the intended population. Second, findings reflect comparisons of self-reported quantitative information the measurement of which implied that participants could accurately recall multiple behaviors in two different periods, during and before the home confinement. Difficulties in comprehension of items that refer to activities and their intensity as well as in accurately recalling their duration are known for increasing the risk of reporting errors in surveys.[37] However, the event of the lockdown was in itself a mega event for the population and it is therefore anticipated that was adequate to cognitively aid participants towards accurately reporting their behaviors during those two periods. Third, as the survey had a wider scope it did not allow for inclusion of measures -for example, on health conditions, motives and autonomous motivation for PA or the availability of home-based equipment-, which could aid interpretation.[38]

4. Conclusions

Our study in a sample of collegiate population has shown an overall worsening trend in PA but also a gendered pattern in observed acute changes in PA during the COVID-19 home confinement, with females being those favored in comparison to males who failed to maintain the same rates of PA as before restrictions. Although, further research is warranted, the evidence provided in the context of the current study will add to mounting scientific evidence on the effect of the pandemic on health-related behaviors and can inform guidelines and interventions that aim at maintaining exercise in the population while experiencing adverse conditions.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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Appendix

Table 1: Sample characteristics (n=565)

	% (n) or M	(SD)$^\alpha$	Md (Q1;Q3)$^\beta$
Age (years)	26.2	(8.9)	22 (20;30)
Gender			
Males	33.3%	(188)	
Females	66.7%	(377)	
Age group			
18-30 years	75.4	(358)	
31+ years	24.6	(124)	
Capacity			
Student	83.6	(473)	
Staff	16.4	(93)	

Notes: $^\alpha$M: mean; SD: Standard Deviation; $^\beta$Md: Median; Q1: lower / first quartile; Q3: upper / third quartile.

Table 2: Changes in IPAQ, MVPA, walking, sitting and weight in the COVID-19 confinement compared to the pre-confinement period, in the total sample and by gender and age group

Total Sample	Before confinement	During confinement	p-value†
	M (SD) Md (Q1, Q3)	M (SD) Md (Q1, Q3)	
IPAQ-SF MET-min (n=483)	3450 (3100) 2464 (1160, 5126)	2887 (2618) 2247 (1074, 3999)	**<0.001**
MVPA, min/week (n=503)	376 (410) 240 (90, 540)	355 (358) 250 (105, 480)	0.713
Walking, min/week (n=501)	367 (428) 210 (100, 420)	258 (313) 150 (60, 360)	**<0.001**
Sitting, min/day (n=524)	246 (329) 180 (60, 310)	359 (370) 300 (120, 500)	**<0.001**
Weight, kg (n=556)	69.5 (16.0) 68 (58, 79)	69.60 (15.8) 67 (57, 80)	0.573

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A RETROSPECTIVE CROSS-SECTIONAL STUDY IN A COLLEGIATE POPULATION IN GREECE

	Males				Females		
Gender	**Before confinement**	**During confinement**	**p-value†**		**Before confinement**	**During confinement**	**p-value†**
	M (SD) Md (Q1, Q3)	M (SD) Md (Q1, Q3)			M (SD) Md (Q1, Q3)	M (SD) Md (Q1, Q3)	
IPAQ MET-min (n=161; 321)	4045 (3276) 3198 (1773, 5813)	3136 (3097) 2274 (1104, 4200)	**<0.001**		3152 (2968) 2250 (1010, 4548)	2762 (2336) 2226 (1074, 3870)	0.260
MVPA, min/week (n=168; 334)	448 (450) 328 (109, 658)	372 (412) 245 (100, 521)	**0.016**		340 (385) 210 (70, 480)	346 (329) 248 (110, 480)	**0.039**
Walking, min/week (n=165; 336)	383 (427) 210 (105, 450)	266 (350) 150 (40, 315)	**<0.001**		360 (429) 210 (95, 420)	253 (294) 150 (60, 360)	**<0.001**
Sitting, min/day (n=176; 348)	269 (482) 180 (60, 360)	374 (436) 300 (175, 520)	**<0.001**		234 (213) 200 (60, 300)	351 (332) 300 (120, 480)	**<0.001**
Weight, kg (n=185; 371)	82.5 (14.1) 80 (74, 89)	82.8 (13.6) 80 (75, 89)	0.258		63.01 (12.62) 60 (54, 69)	63.02 (12.30) 60 (55, 69)	0.887

	18-30 years (n=408)				31+ years (n=133)		
Age Groups	**Before confinement**	**During confinement**	**p-value†**		**Before confinement**	**During confinement**	**p-value†**
	M (SD) Md (Q1, Q3)	M (SD) Md (Q1, Q3)			M (SD) Md (Q1, Q3)	M (SD) Md (Q1, Q3)	
IPAQ MET-min (n=342; 120)	3607 (3198) 2661 (1155, 5346)	3043 (2675) 2407 (1116, 4266)	**0.003**		3041 (2801) 2225 (1253, 3875)	2436 (2413) 1983 (775, 3072)	0.066
MVPA, min/week (n=358; 124)	379 (415) 235 (79, 560)	364 (367) 255 (104, 503)	0.592		364 (408) 240 (90, 480)	316 (321) 210 (93, 446)	0.761
Walking, min/week (n=359; 122)	389 (442) 210 (100, 445)	271 (318) 150 (60, 420)	**<0.001**		312 (378) 180 (90, 360)	228 (305) 150 (30, 280)	**0.012**
Sitting, min/day (n=379; 125)	247 (366) 180 (60, 300)	367 (410) 300 (120, 500)	**<0.001**		242 (204) 180 (60, 360)	336 (239) 300 (120, 500)	**<0.001**
Weight, kg (n=403; 131)	68.3 (15.4) 67 (57, 77)	68.3 (15.1) 67 (57, 78)	0.547		73.2 (17.3) 71 (59, 85)	73.6 (17.3) 71 (60, 86)	**0.012**

Notes: M: mean; SD: Standard Deviation; Md: Median; Q1: lower/first quartile; Q3: upper/third quartile; IPAQ-SF: International Physical Activity Questionnaire Short Form; MET: Metabolic Equivalent; MVPA: Moderate- to vigorous-exercise in the past 7 days; † Wilcoxon signed ranks test

Table 3: Percentage of participants who remained stable (grey cells), moved up (white cells) or moved down (black cells) across the three IPAQ-SF (Inactive, Minimally active, HEPA active) and MVPA groups (Low, Medium, High) in the COVID-19 confinement- compared to the pre-confinement period, in the total sample and by gender and age group

IPAQ-SF	During Confinement			McNemar-Bowker χ^2	df	p-value
	Inactive[a]	Minimally active[b]	HEPA active[c]			
Total sample (N=503)						
Inactive	6.0	5.0	3.9	2.803	3	0.423
Minimally active	6.4	14.3	11.8			
HEPA active	5.0	14.5	33.1			
Gender						
Males (N=168)						
Inactive	6.8	3.7	2.5	14.309	3	**0.003**
Minimally active	5.0	11.2	5.6			
HEPA active	5.6	19.3	40.4			
Females (N=334)						
Inactive	5.6	5.6	4.7	1.541	3	0.673
Minimally active	7.2	15.9	15.0			
HEPA active	4.7	12.1	29.3			
Age-groups						
18-30 years (N=358)						
Inactive	5.0	5.0	5.0	2.909	3	0.406
Minimally active	5.0	13.5	10.5			
HEPA active	5.0	15.2	36.0			
31+ years (N=124)						
Inactive	8.3	5.0	1.7	4.359	3	0.225
Minimally active	9.2	16.7	15.8			
HEPA active	5.8	14.2	23.3			

MVPA	During Confinement			McNemar-Bowker χ^2	df	p-value
	Low[d]	Medium[e]	High[f]			
Total sample (N=503)						
Low	21.7	6.6	9.1			
Medium	6.2	5.4	8.3	1.294	3	0.731
High	7.2	8.5	27.0			
Gender						
Males (N=168)						
Low	22.6	3.6	3.6			
Medium	6.0	6.5	5.4	9.031	3	**0.029**
High	7.7	13.1	31.5			
Females (N=334)						
Low	21.3	8.1	12.0			
Medium	6.3	4.8	9.9	8.004	3	**0.046**
High	6.9	6.3	24.6			
Age-groups						
18-30 years (N=358)						
Low	19.6	7.3	10.6			
Medium	5.6	4.7	8.4	1.740	3	0.628
High	8.4	8.7	26.8			
31+ years (N=124)						
Low	27.4	5.6	4.8			
Medium	7.3	7.3	8.1	0.298	3	0.960
High	4.8	8.9	25.8			

Notes: [a,b,c] as per IPAQ Scoring Protocol)[21]; [d] Low: up to 150 minutes MVPA per week; [e] Medium: up to 300 minutes MVPA per week; [f] High: over 300 minutes MVPA per week; df: Degrees of Freedom.

Table 4: Results from the Generalized Linear Model investigating the odds of being in the medium, or high, than in the low MVPA group, including time (during vs pre confinement period) as a within subject factor, while controlling for gender, age group, sense of security in local area, and change in weight and sitting time between the confinement- and the pre-confinement period (N=463)

	aOR	95% Wald Confidence Interval for Exp(B)		p-value
		Lower	Upper	
Confinement period*female (vs. Pre-confinement period*female)	1.41	1.11	1.80	**0.006**
Confinement period*male (vs. Pre- confinement period*male)	0.67	0.50	0.88	**0.005**
Males (vs. Females)	6.08	2.45	15.12	**<0.001**
31+ years of age (vs. 18-30 years of age)	0.79	0.56	1.12	0.193
Weight gain (vs. Loss)	0.91	0.64	1.28	0.579
Weight stability (vs. Loss)	0.76	0.52	1.11	0.153
Sitting change*female				
Increased sitting time† (vs. Decreased)	1.19	0.70	2.00	0.523
Stable sitting time (vs. Decreased)	1.04	0.58	1.88	0.890
Sitting change*male				
Increased sitting time (vs. Decreased)	0.33	0.15	0.74	**0.007**
Stable sitting time (vs. Decreased)	0.32	0.13	0.78	**0.011**
Lack of security of being outdoors (vs. Sense of security)	0.94	0.69	1.28	0.693
Notes: aOR: adjusted Odds Ratio				