# Effects of Working From Home During the Covid-19 Pandemic on Physical Behaviors Among Office Workers in Brazil

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## SUMMATIVE STATEMENT

Physical behaviors assessed using accelerometers in office workers required to work from home during the COVID-19 pandemic, showed a considerable increase of time-in-bed at the expense of, in particular, moderate-to-vigorous activity, compared to the composition of activities before the pandemic.

## PROBLEM STATEMENT

The coronavirus disease (COVID-19) was classified as a pandemic by the World Health Organization (WHO) on March 11, 2020. In order to slow down transmission, authorities worldwide, including Brazil, have encouraged social distancing and isolation. As part of this, many workers have been required to change their daily routines and work from home to the maximal possible extent. This change has mainly affected office workers, who likely spent extensive time at the computer even before the pandemic, in workdays characterized by sedentary behavior and low levels of physical activity (PA). Concerns have been raised about whether working from home for extended periods would further increase sedentariness, but the impact of social restrictions during the COVID-19 pandemic in Brazil on PA among office workers has not previously been clarified. Data on time spent in different physical behaviors should preferably be objectively assessed, using, e.g. accelerometers, and they should be processed according to Compositional Data Analysis (CoDA) principles (Gupta, Rasmussen, Holtermann, & Mathiassen, 2020).

## RESEARCH OBJECTIVE/QUESTION

The aim of this study was to investigate, using accelerometry analyzed by CoDA, the extent of sedentariness and physical activity among office workers in Brazil while working at home during the COVID-19 pandemic, compared to the situation before the pandemic.

## METHODOLOGY

Eleven office workers (5 females, 6 males; age 39.3 [SD 9.1] years; BMI 28.6 [SD 4.3] kg/m$^2$) from a university in Brazil participated in this study. Data were collected using accelerometers attached to the thigh and upper back continuously for five days in September 2019, prior to the WHO declaration of the COVID-19 pandemic (preCOV), and then again in July 2020, during the COVID-19 pandemic (durCOV). Physical behaviors were determined from the accelerometer recordings using Acti4 (Skotte, Korshøj, Kristiansen, Hanisch, & Holtermann, 2014). Behaviors were then merged into five categories, i.e. sedentary behavior (SB), standing (ST), light physical activity (LPA), moderate/vigorous (MVPA), and time in bed (TIB). Following CoDA procedures, preCOV and durCOV behavior data were transformed into four isometric logratio (ilr) coordinates (Gupta et al., 2020): ilr1 – SB, ST, LPA, MVPA relative to TIB; ilr2 – SB and ST relative to LPA and MVPA; ilr3 – SB relative to ST, and ilr4 – LPA relative to MVPA. The ilr set was analyzed using one-way repeated-measures multivariate analysis of variance (MANOVA), followed by univariate post-hoc tests of pairwise differences.

## RESULTS

Each worker was measured, on average, for 143.0 (SD 2.4) hours in the preCOV wave, and for 147.1 (SD 10.0) hours durCOV. DurCOV time decreased in SB (695 min/day preCOV vs. 675 min/day durCOV), ST (176 min/day vs. 166 min/day), LPA (80 min/day vs. 71 min/day) and MVPA (69 min/day vs. 48 min/day), while TIB increased (419 min/day vs 480 min/day). The MANOVA showed a statistically significant change between preCOV and durCOV in the set of ilrs as a whole ($\Lambda$ = 6.79, F(4, 7), p = 0.01). The post-hoc tests showed that ilr1 was smaller and ilr4 was larger durCOV than preCOV (F(1, 10) = 12.67, p = 0.005; F(1, 10) = 6.50, p = 0.029, respectively), confirming that TIB increased relative to all other behaviors, while MVPA decreased relative to LPA.

## DISCUSSION

We found that office workers spent most of their time in SB both preCOV and durCOV. A previous study using CoDA (Johansson, Mathiassen, Rasmussen, & Hallman, 2020) also reported that office workers spend most of their time sedentary. We observed a statistically significant difference between the overall compositions of behaviors preCOV vs durCOV, with awake time vs. time-in-bed (ilr1) being smaller durCOV, and LPA vs. MVPA (ilr4) being larger. Thus, the most notable changes between preCOV and durCOV were that MVPA decreased and time-in-bed increased durCOV. Both of these changes may be a result of workers having a more flexible schedule during COVID19 than before, i.e. not having to get up in the morning and go to work; combined with no (physical) commuting, and a lack of motivation to engage in physical activities. Our results agree with another study based on objective PA data (Sañudo, Fennell, & Sánchez-Oliver, 2020) in showing that MVPA and TIB changed during COVID19, even though they did not find a decrease in SB as we did.

## CONCLUSIONS

Office workers in Brazil working from home during the COVID-19 pandemic spent less time in MVPA and more time in bed than before the pandemic. Since the office workers were already highly sedentary before COVID19, these changes can be expected to have negative effects on health. Thus, initiatives to increase the extent of MVPA while working from home (e.g. by fast walking and stair climbing) are recommended in order to avoid long-term negative health effects.

## ACKNOWLEDGEMENTS

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