

## Physical activity and sedentary behaviour in cardiovascular disease patients during the COVID-19 lockdown in the Netherlands; a longitudinal cohort study

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### Background

Previous studies showed that the COVID-19 lockdown caused a more inactive lifestyle, but it is unknown whether these acute effects persist over time. We prospectively evaluated changes in physical activity and sedentary behaviour among chronic cardiovascular disease (CVD) patients during the first-wave COVID-19 lockdown and aimed to identify factors associated with physical inactivity.

### Methods

1,565 CVD patients were included and baseline physical activity and sedentary behaviour were assessed using validated questionnaires at 5 weeks after the initiation of the Dutch lockdown (March 2020). Follow-up measures were collected every subsequent 4 weeks until July 2020. Multivariate mixed model analyses were performed to identify whether age, gender, CVD subtype, lockdown adherence and mental health factors impacted changes in physical (in)activity.

### Results

Patients were 67 (interquartile range [60, 73]) years, mostly male (73%) and primarily diagnosed with myocardial infarction (48%) or angina pectoris (18%). Daily time spent in moderate-to-vigorous physical activity was 143 minutes (95% confidence interval (CI) 137; 148) at baseline, with almost no changes during follow-up on a group level ( $\Delta+8.0$  (95%CI -1.1; 17.0);  $\Delta+11.2$  (95%CI 1.9; 20.5) and  $\Delta+8.0$  (95%CI -1.5; 17.5) min/day after 4, 8 and 12 weeks, respectively). Female gender ( $\Delta-40.7$  (95%CI -48.5; -33.0) min/day); heart failure ( $\Delta-23.0$  (95%CI -36.5; -9.5) min/day); fear of a COVID-19 infection ( $\Delta-6.6$  (95%CI -9.4; -3.8) min/day) and limited possibilities for physical activity ( $\Delta-7.4$  (95%CI -10.1; -4.7) min/day) were independently associated with a decrease in physical activity.

Sedentary time was 567 (95%CI 555; 578) min/day at baseline which did not change after 4 weeks ( $\Delta+12.1$  (95%CI -6.0; 30.2) min/day) and after 8 weeks ( $\Delta+15.2$  (95%CI -3.3; 33.8) min/day), but significantly increased after 12 weeks of follow-up ( $\Delta+19.0$  (95%CI 0.1; 37.8) min/day). Lack of social contact ( $\Delta+8.4$  (95%CI 2.3; 14.5); limited possibilities for physical activity ( $\Delta+14.7$  (95%CI 8.8; 20.5) and younger age ( $\Delta+2.1$  (95%CI 1.3; 2.8) min/day) were independently associated with an increase in sedentary time.

### Conclusions

A time-dependent increase in daily sedentary time was observed among chronic CVD patients during the COVID-19 lockdown, whereas physical activity levels did not substantially change. Our findings highlight the need to develop and implement novel solutions to increase physical activity and reduce sedentary time during (and beyond) the COVID-19 pandemic, especially in CVD patients who are female, younger, diagnosed with heart failure, have a lack of social contact, fear of COVID-19 infection and experience limited physical activity possibilities during the lockdown.