

Disruption of outpatient cardiac rehabilitation during the first COVID-19 lockdown in Austria resulted in deteriorating exercise capacity

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Introduction Due to high risk of adverse outcome from COVID-19, it is of crucial importance for patients with cardiovascular disease (CVD) to observe self-preventive measures. But this invariably limits opportunities for physical activity and disrupts established routines for group-based exercise such as cardiac rehabilitation (CR) classes, leading to an increased risk of deterioration in modifiable cardiovascular risk factors.

Methods Mixed-methods design including quantitative (QUANT) and qualitative (QUAL) data collection. Patients who had attended weekly group-based exercise training prior to the COVID-19 lockdown in March 2020 were recruited from an outpatient CR centre in Salzburg, Austria. Post-lockdown QUANT assessment collected data on (1) physical fitness and (2) cardiovascular risk status. Data were compared

with pre-lockdown data from participants' medical records. QUAL data were collected through semi-structured interviews about participants' experience of lockdown and maintaining exercise routines. Interviews were interpreted using framework analysis.

Results Twenty-seven of 49 eligible patients completed all study procedures. In QUANT analysis of maximal ergometer testing, 14 (56%) had deteriorated, 10 (40%) were unchanged, and 1 (4%) had improved post-lockdown. At group level, power was significantly reduced (maximal exercise testing, submaximal ergometer training; table 1, figures 1 and 2). CVD risk factors remained unchanged from pre- to post-lockdown. QUAL analysis corroborated the negative impact of the closure of CR classes. Almost all patients had found alternatives

to keep physically active during lockdown. Seventeen (63%) had not been able to maintain their exercise levels, and 15 (56%) felt their physical fitness had deteriorated. The sense of community and the motivation from training together with others was missed. Several patients reported that, without professional supervision, they did not feel confident to train at high intensity.

Conclusion

- Despite alternative exercises during lockdown, average exercise levels deteriorated.
- Disruption of CR showed a detrimental impact on physical fitness.
- This study highlights the importance of providing group-based opportunities for supervised high intensity training, for patients who engage well in such a setting.

Table 1. Physical fitness in 27 cardiac rehabilitation patients pre versus post COVID-19-related lockdown in spring of 2020

Outcome	Parameter	Pre	Post	Difference	p-value
Maximal bicycle ergometer test ^a	Power (W)	165 (70)	151 (70)	-14 (12)	<0.001**
	Power (% of reference value)	112 (37)	102 (38)	-10 (10)	<0.001**
	Maximal Heart Rate (bpm)	142 (24)	135 (24)	-7 (9)	0.003**
Submaximal bicycle ergometer training session ^b	Power (W)	99 (40)	97 (40)	-2.3 (5.2)	0.038*
	Peak Heart Rate (bpm)	131 (28)	134 (28)	3.0 (22)	0.73
	Average Heart Rate (bpm)	112 (19)	115 (21)	2.4 (11)	0.30

Figures are arithmetic mean (SD); p-values were calculated by paired t-test or Wilcoxon signed rank test (2-tailed, alpha=0.05); * statistically significant at 0.05 significance level; ** statistically significant at 0.01 significance level; ^a n=25; median (IQR) time period between pre and post lockdown test = 11 (10, 20) months; ^b Median (IQR) time period between pre and post lockdown training session = 5 (5, 7) months

Figure 1. Maximal bicycle ergometer test pre versus post COVID-19-related lockdown

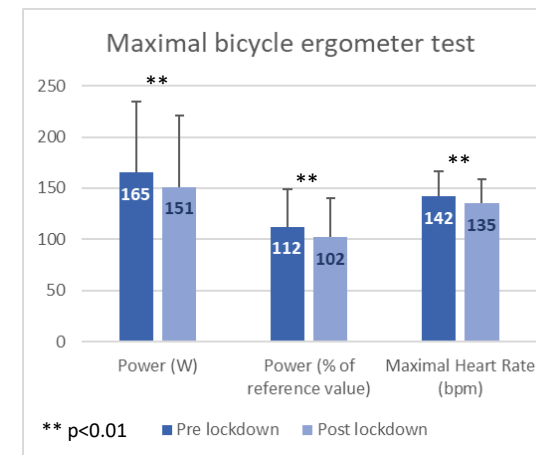


Figure 2. Submaximal training session pre versus post COVID-19-related lockdown

