FaceMasks whilst ExeRcIsing Trial (MERIT): a crossover randomised controlled study

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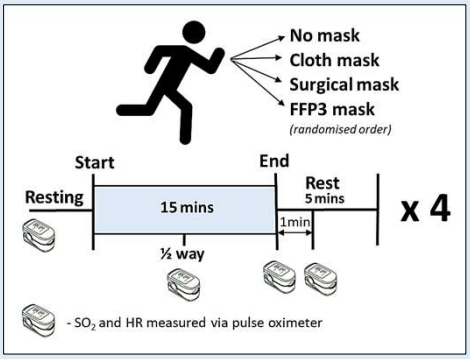
1. Introduction

- Facemasks can reduce transmission of SARS-CoV-2[1] but there is controversy around whether facemasks are safe and acceptable when exercising
- Recent studies assessing the impact of wearing a facemask during exercise have included very small numbers of participants[2-4]

2. Aim

- **Determine the safety and tolerability of healthy young adults wearing different types of facemask during moderate-to-high intensity exercise**

3. Methods



- Four x 15 minutes of moderate-to-high intensity exercise with a 5-minute rest period between each block of exercise
- Pre-specified non-inferiority margin of a 2% difference in oxygen saturation (SO_2 - primary outcome) and 7 beats per minute (bpm) difference in HR

5. Conclusion

- Largest study to date assessing the safety and tolerability of exercising whilst wearing a facemask
- Wearing a facemask during moderate-to-high intensity exercise appears to be safe for healthy young people, with no clinically significant changes in oxygen saturations, heart rate, or exercise performance, regardless of type of mask

4. Results

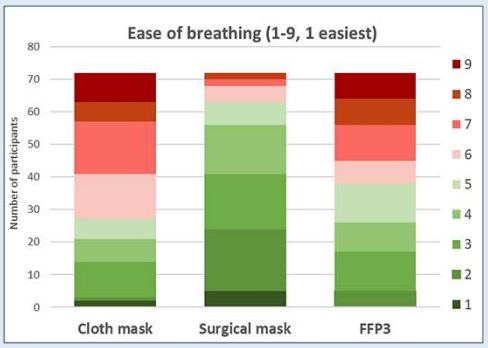
- 72 participants (33 women, 39 men; aged 18-35, mean 23.1 years)

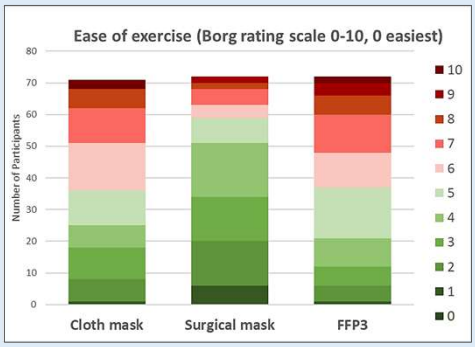
Table 1: Changes to oxygen saturation and heart rate whilst exercising in masks versus no mask

	Avg. oxygen sat (%)	Est. avg diff (mask - no mask) [0.95CI]	Within non-inferiority margin (2%)	Avg. heart rate (BPM)	Est. avg diff (mask - no mask) [0.95CI]	Within non-inferiority margin (7bpm)
No mask: Avg oxygen sat during exercise 97.4%; end of exercise 97.0%. Avg HR during exercise 157.3bpm; end of exercise 158.2bpm						
Cloth mask						
During exercise	96.5	-0.90 [-1.48,-0.32]	✓	157.5	0.10 [-2.90, 3.10]	✓
End of exercise	96.9	-0.07 [-0.57, 0.43]	✓	156.9	-1.20 [-4.56, 2.15]	✓
Surgical mask						
During exercise	97.3	-0.12 [-0.72, 0.49]	✓	157.8	0.78 [-2.33, 3.89]	✓
End of exercise	97.0	-0.03 [-0.55, 0.49]	✓	158.7	0.36 [-3.01, 3.73]	✓
FFP3 mask						
During exercise	96.5	-0.88 [-1.47, -0.29]	✓	159.9	2.84 [-0.24, 5.91]	✓
End of exercise	97.0	0.00 [-0.52, 0.52]	✓	158.9	0.52 [-2.85, 3.89]	✓

- No significant difference in average speed and distance travelled between masks and no mask

Perception of comfort, ease of breathing, and ease of exercise whilst exercising in a facemask





Cloth mask

- *soaked through with sweat and water vapour*
- *like being waterboarded*
- *kept slipping down*
- *sucks in when breathing in*

Surgical mask

- *little restriction*
- *fine*
- *easiest one*

FFP3 mask

- *constraining*
- *so tight fitting it felt difficult to breathe*
- *amenable to glasses-wearing*
- *didn't shake at all whilst running, unlike the others*
- *very comfortable*
- *a good fit*

References

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