

The effects of acute respiratory illness on exercise and sports performance outcomes in athletes – a systematic review by a subgroup of the IOC consensus group on “Acute respiratory illness in the athlete”

Supplementary File 3: Downs and Black Quality Assessment Checklist adapted for non-randomised control trial articles

DOWNS and BLACK Quality Assessment Checklist (Adapted for non-RCT articles)																		
Description		<i>Pyne et al. (2000)</i> ^[1]	<i>Weidner, Anderson et al. (1997)</i> ^[2]	<i>Fricke et al. (2005)</i> ^[3]	<i>Van Tonder et al. (2016)</i> ^[4]	<i>Cunniffe et al. (2011)</i> ^[5]	<i>He et al. (2013)</i> ^[6]	<i>Marinkovic et al. (2016)</i> ^[7]	<i>Weidner et al. (1997)</i> ^[8]	<i>Crameri et al. (2020)</i> ^[9]	<i>Fikenzer et al. (2021)</i> ^[10]	<i>Costello et al. (2021)</i> ^[11]	<i>Komici et al. (2021)</i> ^[12]	<i>Wagemans et al. (2021)</i> ^[13]	<i>Csulak et al. (2021)</i> ^[14]	<i>Anastasio et al. (2021)</i> ^[15]	<i>Savicevic et al. (2021)</i> ^[16]	<i>Vaudreuil et al. (2021)</i> ^[17]
Nr	REPORTING	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0	Answer Yes=1 No=0
1	Is the hypothesis/aim/objective of the study clearly described?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Are the main outcomes to be measured clearly described in the Introduction or Methods section?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	Are the characteristics of the patients included in the study clearly described?	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0
4	Are the main findings of the study clearly described?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

5	Does the study provide estimates of the random variability in the data for the main outcomes?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0
6	Have the characteristics of patients lost to follow-up been described?	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	Have actual probability values been reported (e.g. 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001?	1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1
	<u>EXTERNAL VALIDITY</u>	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0
8	Were the subjects asked to participate in the study representative of the entire population from which they were recruited?	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
9	Were those subjects who were prepared to participate representative of the entire population from which they were recruited?	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	<u>INTERNAL VALIDITY – BIAS</u>	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0	Yes = 1 No = 0 Unable to determine = 0
10	If any of the results of the study were based on “data dredging”, was this made clear?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

11	Were the statistical tests used to assess the main outcomes appropriate?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	Were the main outcome measures used accurate (valid and reliable)?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	<u>INTERNAL VALIDITY – CONFOUNDING (SELECTION BIAS)</u>	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0	Yes = 1 No = 0 Unable to determine= 0
13	Were losses of patients to follow-up taken into account?	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total score		10	9	10	12	12	12	12	12	11	11	12	9	12	12	12	12	10
OXFORD LEVEL OF EVIDENCE		2a	2b	2b	2a	2a	2a	1b	2b	2b	4	4	4	4	2b	4	1b	4

References

1. Pyne, D., et al., *Mucosal immunity, respiratory illness, and competitive performance in elite swimmers*. Med Sci Sports Exerc, 2000. **33**(3): p. 348-353.
2. Weidner, T., et al., *Effect of a rhinovirus-caused upper respiratory illness on pulmonary function test and exercise responses*. Med. Sci. Sports Exerc., 1997. **29**(5): p. 604-609.
3. Fricker, P., et al., *Influence of training loads on patterns of illness in elite distance runners*. Clin J Sports Med, 2005. **15**(4): p. 246-252.
4. Van Tonder, A., et al., *A prospective cohort study of 7031 distance runners shows that 1 in 13 report systemic symptoms of an acute illness in the 8-12 day period before a race, increasing their risk of not finishing the race 1.9 times for those runners who started the race: SAFER study IV*. Br J Sports Med, 2016. **50**(15): p. 939-45.
5. Cunniffe, B., et al., *Mucosal immunity and illness incidence in elite rugby union players across a season*. Med Sci Sports Exerc, 2011. **43**(3): p. 388-97.
6. He, C., et al., *Influence of CMV/EBV serostatus on respiratory infection incidence during 4 months of winter training in a student cohort of endurance athletes*. Eur J Appl Physiol, 2013. **113**(10): p. 2613-9.
7. Marinkovic, D., et al., *Lactobacillus helveticus Lafti® L10 supplementation reduces respiratory infection duration in a cohort of elite athletes: a randomized double-blind placebo-controlled trial*. Appl Physiol Nutr Metab., 2016. **41**(7): p. 782-9.
8. Weidner, T.G., G; Schurr, T; Dwyer, G, *Effects of Viral Upper Respiratory Illness on Running Gait*. J Athl Train, 1997. **32**(4): p. 309-314.
9. Cramer, G.A.G., et al., *Reduced maximal aerobic capacity after COVID-19 in young adult recruits, Switzerland, May 2020*. Euro Surveill, 2020. **25**(36).
10. Fikenzler, S., et al., *SARS-CoV2 infection: functional and morphological cardiopulmonary changes in elite handball players*. Sci Rep, 2021. **11**(1): p. 17798.
11. Costello, B.T., et al., *Athletes with mild COVID-19 illness demonstrate subtle imaging abnormalities without exercise impairment or arrhythmias*. Eur J Prev Cardiol, 2021.
12. Komici, K., et al., *Clinical Characteristics, Exercise Capacity and Pulmonary Function in Post-COVID-19 Competitive Athletes*. J Clin Med, 2021. **10**(14).
13. Wagemans, J., et al., *The Impact of COVID-19 on Physical Performance and Mental Health- A Retrospective Case Series of Belgian Male Professional Football Players*. Front Sports Act Living, 2021. **3**: p. 803130.
14. Csulak, E., et al., *The Impact of COVID-19 on the Preparation for the Tokyo Olympics: A Comprehensive Performance Assessment of Top Swimmers*. Int J Environ Res Public Health, 2021. **18**(18).
15. Anastasio, F., et al., *Mid-term impact of mild-moderate COVID-19 on cardiorespiratory fitness in elite athletes*. J Sports Med Phys Fitness, 2021.
16. Savicevic, A.J., et al., *Performance of Professional Soccer Players before and after COVID-19 Infection; Observational Study with an Emphasis on Graduated Return to Play*. Int J Environ Res Public Health, 2021. **18**(21).
17. Vaudreuil, N.J., et al., *Impact of COVID-19 on Recovered Athletes Returning to Competitive Play in the NBA "Bubble"*. Orthop J Sports Med, 2021. **9**(3): p. 23259671211004531.