

Referees feel stress during matches regardless of their physical condition

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All referees feel stress on match days. However, contrary to what you might believe, a joint study by the Catholic University of Brasilia, A Coruña University and James Cook University in Australia state that the level of stress is not linked to the physical condition of these referees, but to their nervous system. The researchers measured the activity of Spanish football referees on a normal day and on a match day.

"Our study is the first to state that referees' [stress](#) tolerance does not depend on their specific physical condition, but on the state of their [nervous system](#) on non-match days, or the baseline condition" states Daniel A. Boullosa, a teacher and researcher from Vigo and currently at the Catholic University of Brasilia.

The study was carried out on a total of 16 [referees](#) (11 men and 5 women) all from the Galicia Football Referee's Association in Vigo. "It is thanks to the Association representative's collaboration that we were able to collect this sample. It is not easy to compile in one week heart activity records for these sportsmen and women on a match day over 24 hours, as well as on another day of the week, as well as carrying out the physical condition tests without them influencing the days of stress testing" the expert explained.

The data was collected with a cardiometer (Polar RS800) that the referees wore and the variations in heart rate were measured. This technique allows us to infer the activity of the autonomic nervous system – the sympathetic system and the parasympathetic system - and their

response to stressful incidents.

"We must clarify that more beats that does not necessarily mean a greater response to stress, as it could seem. It is not a proportional relationship. This response is more closely linked to variations in the rhythm of these beats, which can be tested with mathematic calculations from their electrocardiographic records" the researcher explains.

The referees that felt more intense activity during the match showed a greater depression in the nervous system in the five hours that followed the match.

Stress is felt even when sleeping

Researchers observed that on match days the referees felt significant stress both in the hours before and after the match, and this response was felt even when sleeping.

The changes observed in referees at night were "of a similar level to those measured in elite athletes after maximum efforts", Boullosa pointed out, and added that "between the control day and the match day, differences of 15% to 75% were observed in the parameters studied, with the greater alterations observed in hours after the end of the match".

The team of researchers also employed the "Yo-Yo" test, to assess the physical condition. This test assesses the ability to repeat intermittent high-intensity efforts, which is a specific quality both of players and referees. There was no link found between a better physical condition shown in the tests and the ability to tolerate stress on the day of the match.

According to these results, strategies to control stress in referees should

be considered, as a chronic level, associated with lower tolerance, could have negative consequences on the referees' health, including a higher incidence of cardiovascular events.

"Their physical preparation should include, on one hand, sprinting and accelerating for their specific physical duties, whilst aerobic conditioning could be better in order to tolerate fatigue and stress on match days" the researcher concludes. Boulosa currently works as a sports scientist in Brazil and applies this model to fighter pilots in the armed forces and workers in the Bank of Brazil.

More information: Daniel Alexandre Boulosa, Laurinda Abreu, Jose Luis Tuimil, Anthony Scott Leicht "Impact of a soccer match on the cardiac autonomic control of referees". *European Journal of Applied Physiology*, 2011. [DOI 10.1007/s00421-011-2202-y](https://doi.org/10.1007/s00421-011-2202-y)

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