

Overweight adolescents are as likely to develop heart disorders as obese adolescents

May 21 2019, by Elton Alisson



Brazilian researchers arrived at this conclusion after conducting cardiovascular fitness tests with boys and girls aged 10-17. The results were published in *Cardiology in the Young*. Credit: Valenti *et al.*

A study performed in Brazil by researchers from São Paulo State University (UNESP) suggests that overweight and obese adolescents have similar increased risks of developing heart disorders. The results of

cardiovascular fitness tests with volunteers aged 10 to 17 were similar in both groups.

Supported by São Paulo Research Foundation—FAPESP, the results of the study were published in the journal *Cardiology in the Young*. The investigation also featured collaboration with colleagues at Kennesaw State University (USA) and Juazeiro do Norte College in Ceará (Brazil).

"Until recently, overweight in adolescence wasn't considered as important a risk as obesity for the development of cardiovascular disease. We found the risks to be similar in both cases," Vitor Engrácia Valenti told. Valenti is a professor at the UNESP campus in Marília and was the principal investigator for the project.

The researchers divided 40 adolescents aged between 10 and 17 into two groups, each with 10 boys and 10 girls: an overweight group with BMI-for-age Z-scores of +1 or +2 and an obese group with Z-scores above +2.

BMI is the ratio of weight to height. Z-scores indicate the number of standard deviations below or above the population mean.

The participants performed a moderate exercise protocol, which involved walking on a treadmill at a slope of 0 percent and required 70 percent of the maximum estimated [heart rate](#) for this age group.

Heart rate variability was measured before and after the exercise session to assess the speed of autonomic cardiac function recovery. Prolonged autonomic nervous system imbalances after [physical exertion](#) have been shown to increase the risk of an acute event and of future cardiovascular disease.

During the first few seconds of an exercise session, the [parasympathetic](#)

[nervous system](#) decelerates cardiac function. One of the two main divisions of the autonomic nervous system, this system conserves energy by slowing the [heart](#) rate and relaxing the body in other ways. After 50-60 seconds, the sympathetic nervous system kicks in, stimulating activity such as increased heart rate via adrenalin release, that prepares the body to react to a stressful situation.

According to Valenti, studies published in recent years have shown that the longer after a period of exertion the autonomic nervous system takes to stabilize so that heart rate returns to normal, the greater the risk of cardiovascular or metabolic disease.

The researchers found no significant difference in [heart rate variability](#) between overweight and obese adolescents or between girls and boys.

"The mean autonomic nervous system variables were practically identical for both groups regardless of sex," Valenti said.

"These findings suggest that overweight adolescents have the same predisposition or vulnerability as that of obese adolescents to cardiovascular diseases such as hypertension and heart failure, as well as to metabolic disorders such as diabetes, dyslipidemia, and high levels of triglycerides and LDL cholesterol."

The number of obese adolescents worldwide has risen sharply in the last 40 years. According to recent studies, the proportion increased between 30 percent and 50 percent per decade in developed countries—in Brazil, the prospects are the same.

More information: Milana D. R. Santana et al, Autonomic responses induced by aerobic submaximal exercise in obese and overweight adolescents, *Cardiology in the Young* (2019). [DOI: 10.1017/S1047951118002007](https://doi.org/10.1017/S1047951118002007)

Provided by FAPESP

Citation: Overweight adolescents are as likely to develop heart disorders as obese adolescents (2019, May 21) retrieved 18 April 2024 from

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