

# The influence of cardiometabolic risk factors on cardiorespiratory fitness in volunteer Chilean firefighters

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## Abstract

### Objectives

Maximum oxygen consumption ( $VO_{2max}$ ) plays a fundamental role in firefighters' occupational activities due to the high intensity tasks they perform in their professional duties. In Chile, firefighters are volunteers (non-salary) and their lack of continuous and programmed physical activity may affect their physical fitness and health. The goal of this study was to determine the influence of anthropometric parameters and cardiometabolic risk (CMR) factors on the cardiorespiratory fitness (CRF) of volunteer Chilean firefighters.

### Methods

Seventy-six volunteer male firefighters (median [5-95 percentiles]) aged 27.5 years [26-56], body mass index (BMI)  $27.7 \text{ kg m}^{-2}$  [19.9-35], and  $VO_{2max}$   $44 \text{ mL kg}^{-1} \text{ min}^{-1}$  [36-56]) participated in the study. The following variables were assessed: BMI, fat mass%, body density, waist circumference (WC), waist-to-hip ratio (WHR), blood pressure, blood glucose, and  $VO_{2max}$ .

### Results

In total, 68% of the samples were overweight or obese. A total of 36% presented abdominal obesity ( $WC \geq 102 \text{ cm}$ ). High blood pressure (HBP) was observed in 25% of firefighters and high blood glucose was found in about 20%. The presence of abdominal obesity was the strongest predictor of  $VO_{2max}$  ( $OR = 12.35$ , 95% CI = 3.56-42.82,  $P < .001$ ), followed by the WHR ( $OR = 11.5$ , 95% CI = 3.1-42.7,  $P < .001$ ) and high blood glucose ( $OR = 2.87$ , 95% CI = 1.7-7.3,  $P = 0.019$ ).

### Conclusion

This study showed that abdominal obesity in firefighters was the strongest predictor of low CRF. In addition, CRF was associated with CMR factors, except for HBP.