Muscular fitness as a mediator of quality cardiopulmonary resuscitation

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Background It has been hypothesized that body mass index (BMI) and muscle strength (MS) of the rescuers are predictors of adequate external chest compressions (ECC). The aims of this study were: (a) to analyze, in college students, the relationship between BMI and MS with adequate ECC parameters; and (b) to examine whether the association between BMI and adequate ECC parameters is mediated by MS. Methods A cross-sectional analysis of the evaluation of a CPR performance test involving students (n = 63). We determined BMI and MS. After previous training, participants performed cardiopulmonary resuscitation on a mannequin for 20 minutes. PROCESS macro developed by Preacher and Hayes was used to assess whether the association between BMI and ECC was mediated by MS. Results Underweight subjects achieved lower results than those with normal weight and overweight/obese in several dependent variables including: correct compression depth (P < .001) and adequate ECC (P < .001). This differences remained after adjusting for muscle strength except for the compression rate (P = .053). Moreover, participants in the low MS quartile were lower in both correct compression depth (P = .001) and adequate ECC (P < .001) than participants in the medium/high quartile after adjusting for confounding variables. The effect of BMI on adequate ECC was partially mediated by MS. Similar results were obtained in the analysis of the mediator role of MS in the relationship between BMI and correct compression depth. Conclusions The ability to provide adequate ECC is influenced by the rescuer's MS. Rescuers should be advised to exercise arm strength to improve the quality of CPR.