Study Physical Fitness by Exploiting an Advanced App

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The World Health Organization provides guidelines for healthy adults aged 18-64 years to improve their physical fitness and health through physical activity. The guidelines suggest that adults should participate in at least 150-300 minutes of moderate-intensity physical activity (e.g., walking) or 75-150 minutes of vigorous-intensity physical activity (e.g., running), or an equivalent combination of moderate and vigorous-intensity aerobic physical activity per week. Several factors, such as cardiovascular fitness and health-related body composition influence the physical fitness of a person. This study documents the progression of these factors and investigates their correlation, based on recent WHO guidelines on physical activity. The study draws useful conclusions about the effectiveness of the three main types of physical activity (moderate intensity, vigorous intensity, or combination of intensities) on the two factors under study. Fifteen participants were recruited, and their cardiovascular endurance and body composition were assessed before being divided into three groups of five participants. The first group followed a moderate-intensity program, the second a vigorous-intensity program, and the third an equivalent combination of aerobic physical activity of moderate and vigorous intensity. Reassessments will be conducted at the end of the study to determine any significant changes and correlations between the fitness factors studied. To collect movement data, a mobile phone application was developed to record and collect data from built-in accelerometers and gyroscope sensors, which were used as input to a machine-learning model to track human activity (walking or running) and conclude about physical fitness. Overall, this study highlights the applicability of mobile phone applications and sensor-based technology to promote physical activity and improve health-related fitness factors, particularly for people with a history of physical inactivity.