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Physical activity (PA) guidelines recommend 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity PA, in addition to muscle strengthening activities, each week. Many questionnaires ascertain PA frequency, duration, and intensity to benchmark achievement of PA recommendations. However, most scoring algorithms utilize absolute intensity estimates when exertion may be influenced by age or other sociodemographic or health characteristics. This study compared PA estimates with and without adjustments for perceived exertion and determined if that difference was associated with individual characteristics. Women (n=2,711) from the longitudinal Study of Women's Health Across the Nation who completed ≥3 Kaiser Physical Activity Surveys (KPAS) across 8 biennial visits were included (baseline age: 46.4±2.7 years). KPAS responses were converted to metabolic equivalent of a task (METs) using the Compendium of Physical Activities to estimate absolute and perceived intensity-adjusted MET values. Latent class growth modeling identified subgroups of participants following similar patterns of change in the difference between absolute intensity-based and perceived intensity-adjusted estimates across time. Four major trajectory classes emerged with patterns reflecting: (1) lessening high-intensity exercise (2.2%); (2) increasingly high-intensity exercise (3.1%); (3) consistently moderate-intensity exercise (92.0%); and (4) consistently low-intensity exercise (2.8%). Consistently low-intensity exercisers, for whom absolute intensity-based estimates exceeded perceived intensity-adjusted estimates, were more likely to be Japanese or Chinese ($p<0.001$) and have lower BMI ($p=0.05$). However, for most participants, absolute intensity-based estimates approximated perceived intensity-adjusted estimates over time, suggesting that traditional PA scoring techniques may provide sufficient estimates for PA in longitudinal cohort studies of mid-life and older adult women.

PHYSICAL ACTIVITY IMPACTS WALKING DISTANCES AND ENERGY CONSUMPTION OF PATIENTS WITH PERIPHERAL ARTERY DISEASE

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Lower extremity peripheral artery disease (PAD) is attributed to buildup of atherosclerotic plaques preventing adequate blood flow, leading to pain during walking, and ultimately physical inactivity. Normal day-to-day levels of physical activity may impact the distance a subject can walk before claudication pain onset, as well as their energy consumption capabilities. This study compared walking performance (initial claudication distance (ICD) and absolute claudication distance (ACD)), and energy consumption (EC) between active and inactive subjects with PAD. The distinction between groups was made using previous research that declared the average PAD patient walks 3586 steps/day. Ten subjects were classified as active (□3586 average steps/day) and sixteen participants as inactive (<3586 steps/day) based on a 7-day accelerometer measurement. The Gardner progressive treadmill test was used to asses ICD, ACD, and EC. EC was measured using a metabolic cart and calculated from the second minute of walking and the last minute prior to stopping due to claudication pain. The average ICD and ACD for the active group were 130.6±106.7 meters and 306.0±184.7 meters, respectively and 143.8±119.0 meters and 248.0±156.0 meters, respectively for the inactive group. The average EC for the second minute and last minute were 9.6±1.9 mlkg-1min-1 and 11.5±2.4 mlkg-1min-1 respectively for active group and 7.0±3.1 mlkg-1min-1 and 8.1±3.8 mlkg-1min-1 respectively for inactive group. The data suggests that the active group had better walking performance and greater energy consumption indicating increased efficiency of oxygen transport and extraction capability in the leg muscles.

PRESCRIBING PERSONALIZED EXERCISE PROGRAMS USING SMARTPHONE SENSORS FOR REMOTE FITNESS ASSESSMENT

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Guidelines for physical activity emphasize multiple fitness components among people aged >65. The age-related increase in variability of fitness components necessitates accurate individualized assessment prior to optimal prescription for personalized exercise program. Accordingly, we tested feasibility and effectiveness of a novel tool designed to remotely assess balance, flexibility, and strength using smartphone sensors (accelerometer/gyroscope), and subsequently remotely deliver personalized exercise programs via smartphone. This pilot study enrolled 52 healthy volunteers (34 females) aged 65+, with normal cognition and low fall-risk. Baseline preliminary data from smartphone fitness assessment were analyzed to generate 42 fitness digital-markers, used to generate personalized exercise programs (5 times/week for 6 weeks). Programs included graded exercises for upper/lower body, flexibility, strength, and balance (dynamic, static, vestibular). Fitness was remotely assessed at baseline and after six weeks. Average age was 74.7±6.4 years; adherence was 3.6±1.7 exercise sessions/week. Significant improvement for pre/post testing was observed for 10/12 digital-markers of strength/flexibility for upper/lower body (sit-to-stand repetitions/duration; arm-lift duration; torso-rotation; arm-extension/flexion). Balance improved significantly for 6/10 measures of tandem-stance, with consistent (non-significant) trends observed across 20 balance digital-markers of tandem-walk and one leg-stance. Balance showed greatest improvement among the 37 participants exercising ≥3/week. These preliminary results serve as proof of concept among people aged >65: high adherence and improved