Affective and Perceptual Responses Between Voluntary Exercise and Electrical Stimulations

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Despite the known health benefits associated with resistance exercise, most individuals do not meet established guidelines. One proposed alternative involves electrical stimulations (E-STIM), but it is unknown how individuals perceive E-STIM relative to that of voluntary exercise. Affective and perceptual responses are important to consider as they are good determinants of long-term adherence. PURPOSE: To compare affective and perceptual responses between voluntary resistance exercise and E-STIM. METHODS: Individuals completed two testing sessions involving three sets of 10 isometric leg extensions. One leg completed voluntarily isometric contractions producing as much force as possible against an immovable lever arm. The opposite leg completed the same exercises involuntary via E-STIM with the stimulation amplitude set to the maximal tolerable intensity. After each exercise, individuals provided affective (ratings of enjoyment) and perceptual (discomfort and perceived fatigue) responses. At the end of each session individuals rated which exercise they preferred to complete. 48h later a second session was completed to determine if these responses changed after repeated use. RESULTS: Twenty-nine individuals (10 females and 19 males) completed the study. Results are expressed as mean (95% confidence interval). For discomfort, there was no condition x day interaction (p=0.124), nor were there main effects. Discomfort in the E-STIM condition averaged 6.0 (5.3, 6.7) as compared to 5.5 (4.7, 6.3) for the voluntary exercise. There was also no interaction (p=0.367) nor were there main effects for enjoyment with both voluntary exercise [0.6 (-0.5, 1.6)] and E-STIM [0.6 (-0.5, 1.7)] rated as “neutral”. For perceived fatigue, there was no condition x day interaction (p=0.961), but there was a main effect of condition (p<0.001), with perceived fatigue greater in the voluntary [5.5 (4.7, 6.3)] as compared to the E-STIM [4.2 (3.4, 5.0)] condition. For participant preference, there were no differences on day 1 (p=0.122) with 17% of individuals having no preference, 35% preferring voluntary exercise, and 48% preferring E-STIM. On day 2, there was a difference (p=0.021) with 10% having no preference, 38% preferring voluntary exercise and 52% preferring E-STIM. CONCLUSION: E-STIM may be a feasible alternative to voluntary resistance exercise as it may reduce sensations of fatigue and tends to be preferred over that of voluntary exercise. Future studies may wish to seek how long-term adaptations compare between these two protocols. SIGNIFICANCE/NOVELTY: This is the first study to our knowledge to compare affective and perceptual responses between E-STIM and voluntary exercise that incorporate the exact same exercise (isometric knee extensions). These results provide support that E-STIM may be a feasible alternative for those unwilling or incapable of performing resistance exercise.