Osteoarthritis, Diet, and Exercise

This study examined the influence of diet and physical activity on health-related quality of life and satisfaction with physical functioning among persons suffering from knee osteoarthritis. A total of 316 participants were randomly assigned to one of four 18-month treatments: exercise only, diet only, exercise + diet, or control. All participants were sedentary individuals over 60 years of age and had a BMI of at least 28. They reported suffering from knee pain on most days, and they had difficulty performing daily activities. The exercise treatment consisted of walking and lower-body resistance training 3 days per week. The diet group used cognitive and behavioral techniques to change dietary habits and lose weight. The diet + exercise group combined both treatments, while the control group met periodically to eliminate confounds related to attention and social interaction. There were no significant differences in adherence rates between the groups, nor were there any differences in ratings of health-related quality of life. However, the diet + exercise group showed significant improvement in physical health compared to the control group. Again, compared to the control group, both the exercise and the exercise + diet groups also expressed greater satisfaction with physical functioning. All three treatment groups showed improved satisfaction with appearance following the intervention.


Startling Findings

In recent years, extensive research has demonstrated that certain aspects of the eyeblink startle response to acoustic stimuli (loud bursts of white noise) are associated with the positivity or negativity of affective responses to a variety of stimuli. In humans this experimental paradigm relies on the electromyographic study of the activity (response latency and amplitude) in the orbicularis oculi muscle, which is responsible for eyeblinks. The paradigm is especially powerful because of numerous parallel neuroanatomical, neurophysiological, and neuropharmacological studies in animals, which have revealed a wealth of information on the mechanisms underlying affective modulation of the startle response. This study was one of the first attempts to examine the applicability of the startle methodology in the context of exercise. Male participants (18 to 35 yrs) were assigned to one of six ordered combinations of three experimental conditions: (a) 20 min of reading quietly; (b) 20 min of stationary cycling at 40% VO₂peak; or (c) 20 min of stationary cycling at 75% VO₂peak. They were classified as high or low on physical activity based on an activity history questionnaire. Startle responses were examined across 10 trials occurring every 30 sec, 5 min before, and 5 and 25 min after exposure to one of the three experimental conditions. None of the main ef-
fects or interactions were significant for either the amplitude or latency of the electromyographic startle responses. The authors concluded that startle responses can be studied in the context of exercise without concern that activity status will confound the evoked responses. They also recommended that future studies examine affective responses to exercise in terms of both pleasure/displeasure and perceived arousal.


**Supporting Exercise**

Litt et al. examined whether three constructs from social-learning theory, namely readiness to change, self-efficacy, and social support, would predict initiation and adherence to exercise for a group of older women. The sample consisted of 189 women between the ages of 59 and 78 who had been diagnosed with low bone density and were receiving estrogen replacement therapy. Two types of self-efficacy (for adherence and barriers) and two types of social support (general and exercise-specific) were assessed. Readiness for exercise was estimated from the Exercise Adoption Scale. Adherence was assessed every 3 months during a 12-month exercise program by asking how many days in the previous 30 participants had exercised at all and at moderate intensity. These reports were verified by examining the exercise logs. There were two exercise programs, one for upper body conditioning and one for lower body conditioning, but exercise type had no effect on adherence. At 3 months, adherence to moderate exercise was best predicted by initial readiness for exercise and social support for exercise. At 12 months, the only variable that accounted for significant variance in days of moderate exercise was contemporaneous social support for exercise.


**Preparing to Respond**

Electroencephalography (EEG), the study of the brain’s electric potentials, can shed light on the chronology of decision-making and action preparation processes in the brain. Stimulus-preceding negativity (SPN) is thought to reflect the anticipation of task-relevant stimuli; P3 is believed to be associated with cognitive processing speed; and the amplitude of the contingent negative variation (CNV) is thought to reflect motoric preparation. The separate examination of these three features of the ERP waveform could reveal whether the effects of physical fitness are related to stimulus anticipation (i.e., SPN), to stimulus discrimination and processing (i.e., P3), or to the preparation and initiation of the motoric response (i.e., CNV). The sample consisted of 24 men and 24 women belonging to one of four gender-balanced groups: older trained, older sedentary, younger trained, younger sedentary. The older participants were 60 to 70 years of age whereas the younger ones were 18 to 28 years of age. The task consisted of responding to a sequence of three stimuli: (a) a warning about the difficulty of an upcoming decision task (S1); (b) presentation of the decision task (i.e., choosing the taller of 2 bars; S2); and (c) a signal to begin the response. Older participants showed increased amplitude of
SPN prior to S2 and longer latencies in response to S2. Fit participants showed decreased amplitude of CNV compared to sedentary participants. Most interestingly, age and fitness showed an interaction, with the P3 latency to S2 being longest among the older sedentary individuals, followed by the older fit, and then the two younger groups. There were no group differences for reaction time to S3 or the percentage of correct responses. Overall, the results suggested that fitness had a positive influence on cognition and an even greater influence on motor preparation.


**Transtheoretical Heresy**

This study examined the ability of the Transtheoretical Model (TTM) to predict transitions between the exercise stages of change in a random sample, initially consisting of 1,602 adults (Time 1). These consenting respondents were surveyed again via telephone after 6 months (Time 2) and via mail at 12 months (Time 3). The final sample completed all 3 surveys and consisted of 683 individuals. Each survey included assessments of stage of change, self-efficacy, pros, cons, experiential processes of change, behavioral processes of change, and background information, using instruments slightly modified for Canadian respondents. No TTM construct predicted a forward transition out of precontemplation from Time 1 to Time 2, but self-efficacy, pros, and behavioral processes of change predicted stage transition from Time 2 to Time 3. Self-efficacy, pros, and behavioral processes predicted forward transition from contemplation both at Time 1 to 2 and at Time 2 to 3. None of the TTM constructs predicted forward stage transition out of preparation at Time 1 to 2, but self-efficacy and cons predicted forward transition at Time 2 to 3. Self-efficacy and behavioral processes predicted retention in the action/maintenance stage at Time 1 to 2 and self-efficacy, pros, cons, experiential processes, and behavioral processes predicted retention at Time 2 to 3. In the Discussion, the authors undertake a critical analysis of the validity of several aspects of the TTM.


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