Research Bites, May 2022, by Mary Yoke, PhD, FACSM, MA, MM

Let's Consider the Effect Fitness Assessments Might Have on a Person's Intrinsic Motivation, Competence, and Autonomy

Do you perform fitness assessments on your clients or class participants? If so, have you considered how the delivery of their fitness assessment results might affect them? In a 2021 study, researchers Chandler, Lee, Lesniak, and Herring aimed to answer this question (1). Specifically, they were interested in how fitness assessment results affected participants' intrinsic motivation, feelings of exercise competence, and autonomy.

While most health/fitness professionals have training and experience in providing fitness assessments, there is very little research on the effect these assessments might have on those being put through the various tests and protocols. Many of us may have assumed that the knowledge gained from assessment results would increase our clients' motivation to become more fit and become lifelong exercisers. Most health/fitness educational programs have required us to become adept at administering cardiorespiratory tests, muscular fitness and flexibility assessments, and even tests of neuromotor components such as balance and agility. Such assessments have allowed us to measure change over time, and presumably helped to increase our clients' intentions to exercise and adherence to their fitness programs. Chandler et al questioned this premise and decided to explore what happens to study participants surveyed at four time points after fitness assessments were administered.

Utilizing a quasi-experimental design, Chandler et al randomly assigned 430 college students (mean age of 19.44 years; 156 males and 274 females) into either an intervention group or one of two control groups. The intervention group was the fitness assessment group (n=157). For the control groups, one group consisted of health science students who received a voucher for an assessment during the following semester (n=150), the other group was comprised of students in a sociology (non-physical health) class (n=123). All students were surveyed at four time points during the semester: 1) baseline, 2) after the fitness assessments were performed on the intervention group, 3) immediately after the results were received, and 4) end of the semester. The dependent variables included perceived competence, autonomy, and intrinsic motivation. The independent variable was the fitness assessment.

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It's important to note *how* the fitness assessment results were delivered to the intervention group; they were sent to respondents via a computer-generated document. According to the authors, the first page provided the student's scores; the second page showed their results in a bar graph where they were compared to other college students. Descriptors such as "below average", "average", and "above average" were used. A final page simply described the components of fitness that were measured.

All three groups (intervention group plus the two control groups) were given a survey at all four time points. This survey measured participants' perceived level of competence (e.g. "I think I am pretty good at exercise/physical activity"), autonomy (e.g. "I feel that it is my choice to engage in exercise/physical activity"), intrinsic motivation (e.g. "I find exercise/physical activity very interesting"), and self-reported physical activity (e.g. On how many of the past 7 days did you do exercises such as push-ups, sit-ups, or weight-lifting?).

What were the results? Intrinsic motivation, competence, and physical activity *decreased* significantly for those in the fitness assessment group who perceived their feedback negatively, compared to the control groups. The authors write that apparently, in some way, the feedback made some of the students feel *less* competent. Autonomy decreased significantly for all three groups over the semester, perhaps due to increasing academic student workloads.

It seems that a key take-home message for readers of this journal is that we need to pay attention to *how* fitness assessment feedback and results are delivered. We may need to use motivational interviewing and coaching skills, in addition to providing appropriate exercises and activities, in order to positively impact behavior change in our clients and participants. After all, our goal is to *increase* motivation and well-being, not the reverse. More research is needed to explore optimal strategies for the delivery of fitness assessment results!

Do Cardio and Muscular Fitness Assessments Help to Increase Physical Activity?

In another interesting 2021 study, researchers Langland, Sathnur, Wang, and Olson (2) wanted to explore whether simple cardiorespiratory and muscle strength tests would influence participants' subsequent exercise and physical activity; assessments of these two components of

fitness were chosen because of the multiple, well-documented health benefits associated with cardiorespiratory and muscular fitness.

Study participants were recruited at the Minnesota State Fair, and were then randomized into either an intervention or a control group. Altogether, there were 1,315 participants: 656 in the intervention group and 659 in the control group (mean age = 46; mean BMI = 25; 63% male and 37% female). All participants were given educational information (including ACSM recommendations) on physical activity. Additionally, everyone answered two questions from the Exercise Vital Sign (EVS) measure: 1) "On average, how many days per week do you engage in moderate to strenuous exercise like a brisk walk?" and 2) "On average how many minutes do you engage in exercise at this level?" Those in the intervention group were given two assessments: a grip strength test using a hand-grip dynamometer (an assessment of muscle fitness), and a timed step test which allowed an estimate of VO_2 max (a measure of cardiorespiratory fitness). All study participants were then contacted three, six, and 12 months after baseline and were asked the EVS questions again at each time point.

The findings showed that there was no significant change in Exercise Vital Sign responses at follow-up in either the intervention or the control group. In other words, total exercise levels apparently remained relatively consistent in both the intervention and the control groups. There were some trends, however. For example, less active participants showed an increase in minutes of physical activity at 6 months, followed by a slight decrease. And there were significant changes in the types of exercise; such as the intervention group reporting increased resistance exercise at 3 months compared to the control group. It should be noted that not all participants provided follow-up responses; 62.6% of participants provided a response at one or more of the time points, and only 20% of participants responded at all three time points. Also, it was found that most of the self-selected participants were already very physically active at baseline, based on their responses to the EVS.

The authors conclude that grip strength assessments and estimates of VO_2max via the step test did not result in significantly increased physical activity over a period of 12 months in this population. However, the Exercise Vital Sign prompts and the educational exercise information did help less active individuals move more at the 6 month mark. Therefore, these

strategies, along with the grip strength test and the step test, may provide useful incentives for some participants.

Given the global increase in obesity and the related decrease in physical activity, the two studies summarized above provide potentially helpful information as we search for more meaningful ways to motivate people to exercise and become active.

Postural Alignment in College Students: What Do We Know?

If you've been on a college campus recently, then you may have noticed an increasing phenomenon dubbed as "text neck". This misalignment of the cervical and thoracic spine is caused by leaning forward for long periods while texting or concentrating on the screen of an improperly placed laptop or tablet, and it can result in headaches and neck and upper back pain. Exactly how common is text neck? In a 2021 study by Farmer (3), alignment deficits among college students, and the relationship of such deficits with muscle fitness and mobility, were assessed. One of the stated goals of Farmer's study was to see if students with neutral (ideal) body alignment would score higher on muscle fitness and mobility tests than students with alignment problems. Neutral body alignment was defined as having no deficits in the sagittal, frontal, and transverse planes.

A diverse sample of 502 college students (31.5% male, 67.5% female; age range 17-35 years) volunteered for the study. All assessments were conducted during the students' regular physical education classes, and students entered their data on their cell phones.

The following areas of the body were assessed for deficits or neutrality in the sagittal plane: lumbar curve, pelvic tilt, head, shoulders, elbow, and knees. In the frontal plane, the head, shoulders, hips, knees, ankles, and foot arches were assessed for deficits or neutrality. Shoulders, back, and pelvic girdle were assessed in the transverse plane.

Muscle fitness was assessed via push-ups, air squats, and planks; grip strength was measured via a hand dynamometer. Mobility was assessed with a standing toe-touch, a lying hip flexion test, the superman test for shoulder mobility, and the Apley scratch test for shoulder mobility. Differences between dominant and non-dominant sides were noted.

It was found that forward head was indeed the most common alignment deficit in the sagittal plane (47% of students), most likely the result of constant smartphone usage. A related misalignment was the forward placement of the shoulders (37%), which I assume also means excessive scapular protraction. Likewise, uneven/tilted shoulders were common (56%), as evidenced in frontal plane assessments. Overall, 96% of students had at least one alignment deficit, and the author surmises that a "neutral" body alignment is not typical in this population. Females were shown to have more alignment problems than males, and underweight and overweight students had more misalignments than normal weight students. It was also found that alignment issues were related to lower scores on the various muscle fitness tests. Stated another way, muscle weakness hinders good alignment, according to the author.

Study limitations include the fact that there were no descriptions of push-up, air squat, and plank tests in the published article. A postural assessment was apparently performed, but the protocol was not available online. Additionally, data for the alignment assessment was based on participant self-observation, and the data for the various fitness assessments depended on participant adherence to specific protocols, a difficult feat since students were assessed in groups.

Even so, given the high rate of postural misalignments in college students, and the apparent correlation between body alignment and lower muscular fitness, it appears that more attention needs to be focused on the promotion and maintenance of ideal/neutral alignment of major joints. A take-home message for health/fitness professionals is that we need to attend to postural assessments and hone our ability to see and correct misalignments in our clients. On numerous occasions I have personally witnessed fitness trainers exhorting their client to work harder and crank out more and more reps and sets, even though the client was seriously out of alignment in multiple joints and body segments during the exercise. We can do better!

References:

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