Isokinetic Performance in Low Back Pain Patients: The Predictive Power of the Self-Efficacy Scale

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The Self-Efficacy Scale (SES) has been found to predict isokinetic performance better than anthropometric variables. This study tests the predictive power of SES further against other measures of efficacy expectancies as well as measures of depression and perceived disability. A group of 105 chronic back pain patients was administered Beck’s Depression Inventory (BDI), SES, the Pain Self-Efficacy Questionnaire (PSEQ), and the Oswestry low back pain disability questionnaire (OSWESTRY). Total isokinetic work done was measured at slow, medium and high speeds, for which multiple regression models were fitted controlling for sex, age, weight and height. The results confirmed SES to be the best overall predictor of isokinetic performance. BDI was not significant as a predictor of isokinetic performance. The models also revealed that SES predicts less well with increases in the test speed, particularly in extension. These results provide further evidence of the diagnostic value of SES relative to OSWESTRY and PSEQ.

KEY WORDS: isokinetic performance; low back pain; self-efficacy expectancies; disability; prediction.

INTRODUCTION

In the ever greater number of studies being performed on Low Back Pain (LBP) the role attributed to nonsomatic factors is becoming increasingly pronounced (1–3). As with LBP in general, evidence is mounting that behavioral and psychological factors also affect the results of dynamic strength iso-measurement (4).

It has been suggested that the significant motor impairment of chronic LBP patients can be at least partially accounted for by avoidance learning, in which the negative reinforcement of experienced pain causes patients to avoid particular types of motor activity. Expectations come to be formed with respect to each

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kind of activity, guiding the choice of what will be attempted and what will be avoided. But in addition to being differentiated by activity, expectancies of differing definitional qualities have also been distinguished. Yet while diverse measurement instruments have been implemented, self-efficacy has been the principal expectancy construct addressed by many theoretical discussions and psychometric instruments.

Self-efficacy was originally conceived as the central concept within a theoretical framework for analyzing changes in avoidant and fearful behavior. As proposed by Bandura (5), this theoretical framework submits that behavioral changes are mediated by cognitive processes irrespective of the particular methods used to bring them about, and that cognitive events are primarily modulated by experiences of mastery emanating from effective performance. Within this context Bandura found it necessary to distinguish sharply between outcome expectancies and efficacy expectancies. Definitionally, an outcome expectancy is "a person's estimate that a given behavior will lead to certain outcomes." In contrast, an efficacy expectancy is "the conviction that one can successfully execute the behavior required to produce the outcomes" (5). There is arguably a degree of overlap between these two forms of expectancies, in that a subjective "estimate" is in some ways as much a belief as a "conviction" is. Subsequent work on expectancies has spawned an array of variations in the definition of expectancies, some of them referring to comparable constructs and others to differing constructs (6-9). Within the present paper, this "nebulous and elusive" (9) conceptual field will be avoided by adhering to Bandura's original formulation.

A number of new instruments for the measurement of dynamic muscle strength were developed and commercialized in the 1980s. These isomachines were thought to provide relevant, accurate, and reliable information for diagnostic, screening, and rehabilitation follow-up purposes. Current evidence, however, points in quite the opposite direction (4). If iso-machines are to have any practical clinical use, a more profound understanding of the factors which affect performance as measured by them is necessary.

In current practice, it is common to adjust isokinetic performance for the anthropometric variables of sex, body weight and age, including perhaps height at most; remaining performance variations are ascribed to supposed somatic factors. A recent study performed by Estlander et al. indicates, however, that anthropometric variables are not in fact very good predictors of isokinetic performance, and that self-efficacy beliefs as measured by the Self-Efficacy Scale (SES) are a much more powerful predictor (10). The purpose of this study is to test the predictive power of SES further against other competing alternatives suggested by the literature, including measures of depression, efficacy expectancies and subjective disability. Depression is nominated by the epidemiologically detected association between psychological or emotional problems and diagnosed back disorders (11). Efficacy expectancies are nominated by the documented predictive power of SES (10). Finally, subjective disability is included because iso-measures have been claimed to provide information relevant to the diagnosis and identification of back conditions. The present study focuses solely on the predictive power of the selected attribute measures. Questions concerning the connection between the attributes and isoki-