1. Please translate the following "abstract" into CHINESE text (20%) and give an "English title" for this abstract (5%).

Abstract

The foot provides an important source of afferent feedback for balance and locomotion. Sensory feedback from the feet can be altered by standing or walking on different surfaces. The purpose was to determine the effects of textured footwear on lower extremity muscle activity, limb kinematics, and joint kinetics while walking. Three-dimensional kinematics and kinetics, as well as muscle EMG, were collected as subjects walked with a smooth and textured shoe insert. Muscle activity was analyzed using a wavelet technique. The textured shoe insert caused a significant reduction in both soleus and tibialis anterior intensity during periods when these muscles are most active. Furthermore, the changes in muscle activity were only seen in the low frequency content of the EMG signal. The foot was significantly more plantar flexed at heel strike with the textured inserts. Small changes were also seen in vertical ground reaction forces and joint moments. It was assumed that the changes in gait patterns were due to a change in sensory feedback caused by the textured shoe insert. The possibilities of altered sensory feedback with footwear are discussed. Sensory feedback from the feet may affect specific motor unit pools during different activities. Changing the texture, without changing the geometry, of a shoe insert can alter muscle activity during walking. This may be useful in the prescription of footwear interventions and suggests that footwear may have sensory as well as mechanical effects.

(Adopted from Nurse MA, et al., Journal of Electromyography and Kinesiology 2005; 15: 496–506)

2. After reading the following texts adopted from a review article on progress resistance exercise written by Taylor and colleagues and published in the journal Physical Therapy (2005;85:1208-23), please answer questions A and B in *ENGLISH*, using full sentences. (25%)

The principles of progressive resistance exercise (PRE) for increasing force production in muscles have remained virtually unchanged since they were described by DeLorme and Watkins[1] almost 60 years ago. These principles are (1) to perform a small number of repetitions until fatigue, (2) to allow sufficient rest between exercises for recovery, and (3) to increase the resistance as the ability to generate force increases. These principles are detailed in the guidelines of the American College of Sports Medicine (ACSM),[2] where it is recommended that loads corresponding to an 8- to 12-repetition maximum (RM) be lifted in 1 to 3 sets, training 2 or 3 days each week. An 8RM to 12RM load is the amount of weight that can be lifted through the available range of motion 8 to 12 times before needing a rest.

Traditionally, PRE has been used by young adults who are healthy to improve athletic performance. However, recent reviews have emphasized the potential health benefits of including PRE as part of the promotion of physical activity in the community.[3,4] The potential health benefits of incorporating PRE into an overall fitness program include helping to reduce risk factors associated with osteoporosis as well as diseases such as cardiovascular disease and diabetes.

The health benefits associated with PRE also may make it a useful intervention in physical therapy. A reduced ability of muscles to generate force, due to injury, pathology, or disuse, is a common impairment in clients seen by physical therapists. If a lack of force generation by muscles is an impairment contributing to an inability to perform everyday activities, then this provides a rationale for physical therapists to apply the principles of PRE when designing treatment programs.

Despite the prevalence of impairment in the ability to exert adequate muscle force, the extent to which PRE has been used in physical therapy is not well known because of the variable use of the term "strengthening." The term "strengthening" has been criticized because of its vagueness, as it could be misinterpreted as referring to any type of muscle training exercise.[5] To illustrate this possibility, a survey of physical therapy treatment choices for musculoskeletal impairments suggested that the prescription of "strengthening" exercises may be relatively common.[6] It was reported that between 52% and 69% of physical

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therapy treatments for spinal impairment included "strengthening" exercises and that up to 87% of treatments for knee impairments included "strengthening" exercises.[6] However, a difficulty in interpreting data such as these is the inconsistent use and perhaps overuse of the term "strengthening" and, when used, whether the exercise regimens were consistent with the principles of PRE. Therefore, the extent to which PRE has been used or is appropriate for physical therapy remains unclear.

Concerns have been raised about the possible negative effects and safety of PRE. Traditionally (eg, in the area of neuromuscular physical therapy), there have been concerns that training muscles to increase force production could have a negative effect by increasing muscle spasticity.[7] In musculoskeletal physical therapy, safety concerns have been raised about the application of the relatively high forces required for PRE training through healing tissues, such as through bone after fracture.[8]

The primary aim of this review was to examine the positive and negative effects of PRE as an intervention in physical therapy using evidence from available systematic reviews. Where more than 1 systematic review was available in an area, the quality of the systematic reviews was taken into account in interpreting the findings. The key question to be answered in this review was: What is the evidence that PRE can improve outcomes in people who would be prescribed treatment by a physical therapist? Evidence about the positive or negative outcomes of PRE was described according to the domains of the *International Classification of Functioning, Disability and Health (ICF)*.[9] Using this framework, within the domain of "Body Function and Structure," evidence available about whether PRE could improve the ability to generate muscle force was analyzed. Within the domain of "Activities and Participation," evidence about whether the ability to complete everyday tasks or the ability to participate in societal roles had improved was analyzed.

Question A: What were the possible positive effects of progress resistance exercise as an intervention in physical therapy described in this review article? (15%)

Question B: Why the term "strengthening" cannot represent the progress resistance exercise? (10%)

3. After reading the following *Introduction* section adopted from a recently published paper by Denise G. Tate in Arch Phys Med Rehabil (2006; 87: 160-7), please write down a paragraph in CHINESE (within 200 words) to describe "The art and science of rehabilitation". (25%)

THE ART AND SCIENCE OF REHABILITATION

Concepts of art and science are often thought of as opposites, yet their twin characteristics of creation and discovery suggest many similarities between the 2. Leonardo DaVinci exemplified this holistic principle. He was a Renaissance painter, architect, engineer, mathematician, and philosopher who flexibly contributed to both scientific and creative fields. Sigmund Freud described him as a man who awoke too early in the darkness, while others were all still asleep.[1] The creation and discovery that underpin art and science become more apparent when we examine how they relate to rehabilitation. Art is defined as "the products of human creativity," "the creation of beautiful and significant things," and "a superior skill that you can learn by study and practice by observation."[2] Rehabilitation artistry is perhaps best expressed in an earlier Coulter lecture by Lauro Halstead, MD, when he emphasized the need for going beyond our science to provide humanistic care. Arts and humanities are intrinsically related, whereas art and science are extrinsically related. Like art, science as "humanistic care . . . refers to the broad accumulation of human experience and knowledge that has evolved over the centuries in each culture and in life events of each individual. It is subjective, intuitive, and empathetic . . ."[3](p149-50). From a clinical perspective, this process requires that the rehabilitation professional use creative skills, knowledge, and emotions to treat and care for patients. From a research prospective, the art of rehabilitation can be best understood as the portion of unexplained statistical variance associated with test results. Science, in seeming contrast, is defined by applying the principles of the scientific method, which includes making empirical observations, proposing hypotheses to explain those observations, and testing those hypotheses in valid and reliable ways. "Science also refers to the organized

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body of knowledge concerning the physical work, both animate and inanimate, but a proper definition would also have to include the attitudes and methods through which this body of knowledge is formed; thus, a science is both a particular kind of activity and also the results of that activity."[4](p2) In part, this growth in science results from the association of rehabilitation with disciplines such as cell biology and molecular genetics, as they open new opportunities for the treatment and cure of many conditions such as multiple sclerosis and spinal cord injury (SCI). Furthermore, advances in pharmacotherapeutics now provide, if not a cure, certainly control and palliation of so many disabling conditions. This is probably what most people define as "the science of rehabilitation," because this type of knowledge can be directly derived from empirical and scientific investigations.

4. ***Please answer the following questions in ENGLISH after reading the following texts and figure.***
Question A: How many patients were recruited in this study? (5%)
Question B: How many patients were eventually excluded during this study, and what the reasons causing these exclusions were? (15%)
Question C: How many patients met the final inclusion criteria? (5%)

METHODS
Participants
This prospective randomized controlled study design combines baseline and postintervention measures of cardiovascular and respiratory systems' ability to perform their major functions. All patients participating in the study were consecutively referred by their physicians to the cardiopulmonary laboratory of the Department of Physical Medicine and Rehabilitation of this institute after submitting to coronary artery bypass graft (CABG) surgery between 2001 and 2003.

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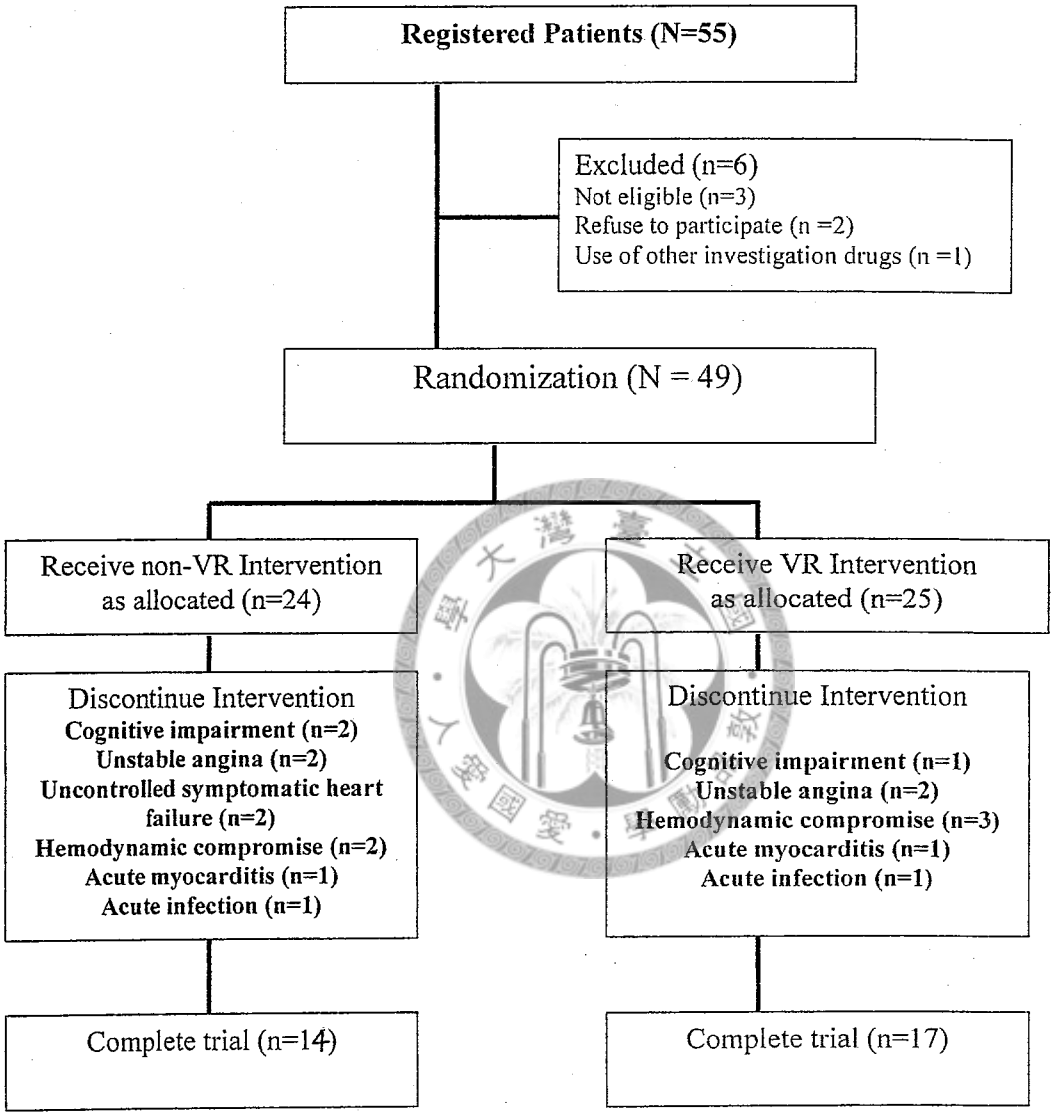

Fig 1. The CONSORT flow diagram outlining the progress of participants through the various phases of the randomization.

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