

CHAPTER 1

INTRODUCTION

Low back pain is a common condition affecting about 70-85% of the population (1). The cause of low back pain varies in different age groups. In younger patients, low back pain may result from sprains, strains, and disc protrusions while facet osteoarthritis, degenerative spondylolisthesis, and degenerative lumbar spinal stenosis are more common in older patients (2). However, the most common diagnosis for all ages is nonspecific low back pain that normally recovered within 2 months (3).

Approximately 10-20% of back pain patients will develop chronic low back pain, defined as pain and disability persisting for more than 3 months. These patients bear a significant cost burden in particular economical and social costs (4). It was estimated that more than 80% of healthcare cost in these patients was used for back trouble, while treatment had a low success rate (5).

Low back pain is defined as pain felt between areas of the 12th rib and the lower gluteal folds (6). Numerous researches suggested that chronic low back pain is related to impairment of the trunk muscle function in term of endurance and flexibility (7). Decreasing in trunk muscles endurance and flexibility appear to be one of significant risk factor in the development of chronic low back pain (7). In

addition, poor neuromuscular control of the lumbopelvic complex is believed to contribute to the onset of or incomplete recovery from spinal injuries (8). Moreover, psychological stress is typically developed in chronic low back pain patients as a result of residual pain and disability (9). Therefore, effective chronic low back pain treatment should address all aspects mentioned above.

Over the last few decades, exercise has been promoted for the treatment of chronic low back pain. Exercise is applied to patients to improve impaired back function, decrease back pain symptoms and minimize disability by diminishing excessive fears and concerns about back pain (10). Several different exercise programs have been advocated to promote these goals but optimal way to implement this treatment is unknown.

As there is an uncertainty about the best way to prescribe exercise, an enormous variety of exercise programs are currently offered to patients. Core stability is one type of exercise commonly used in the management of chronic low back pain (11). The focus of exercise is varied and may include parameters ranging from strength and endurance training, to specific training of muscle coordination and control. The assumption underpinning these approaches is that improved neuromuscular function will restore or augment the control and support of the spine and pelvis (12).

One exercise approach frequently referred to as Pilates. The Pilates method was developed by Joseph H. Pilates and was initially practiced almost exclusively by

athletes and dancers (13). Pilates exercise may be divided into two broad categories: mat and apparatus exercises. The first exercise developed by Joseph Pilates was mat exercise, which as the name implied was done on a mat and floor. Pilates then created a number of apparatuses that required one to exercise against resistance, being provided by the use of springs and pulleys (14).

In recent years, Pilates exercise has become a popular trend in rehabilitation and fitness. The major principle of the Pilates method is the concept of centering. While Joseph Pilates believed that all muscles of the body should be strengthened and stretched (15), he felt that the major emphasis should be placed upon the muscles of the center, or core, of the body (13). He referred to this region as the powerhouse of the body.

Abdominal control is performed by pulling the umbilical inward and upward to the spine. This action is referred to as “abdominal hollowing action”. Abdominal hollowing action provides stabilization for trunk, pelvic and scapular. During Pilates training, participant must concentrate on coordination of movements and breathing pattern. Pilates instructors provide physical assistance and verbal feedback to maximize accuracy as well as safety during exercise. The Pilates mat exercise progression initially begins with a wide truncal base of support in prone, side-lying, or supine positions, while moving the limbs to vary torque on truncal muscles. As the participant develops improved strength and form, the base of support is gradually reduced to retrain proprioceptive mechanisms while fostering more efficient movement patterns.

Pilates is similar in principle to the dynamic stabilization exercise widely used in the treatment and prevention of musculoskeletal low back pain, which advocates promoting efficiency of deep stabilizers and decreasing contraction of muscles counterproductive to the activity (16). Joseph Pilates noted that mobilizing early in rehabilitation resulted in reducing recovery period after musculoskeletal injuries. Therefore, Pilates training may be suitable for patients with chronic low back pain. Although Pilates training is widely used among dancers and back pain patients for improving abdominal endurance, trunk and hip flexibility and also body alignment especially in regards to the pelvic girdle (17, 18), scientific evidence of Pilates training is unknown.

Purpose of the study

To evaluate the effects of Pilates training on lumbopelvic stability, pain, flexibility, and stress in chronic low back pain patients.

Hypotheses

Pilates training results in improvement of lumbopelvic stability, pain, flexibility, and stress in chronic low back pain patients.