

EFFECTS OF BACKWARD WALKING ON GAIT PARAMETERS IN PEOPLE WITH STROKE: A SYSTEMATIC REVIEW

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ABSTRACT

According to the Centers for Disease Control, roughly 795,000 people in the United States experience a stroke each year. A common result of a stroke is the negative impact on the person's gait, including an asymmetrical gait pattern, a slower cadence, and decreased stride and step lengths. A well-structured, comprehensive rehabilitation program is necessary to address the gait deficits and reduce the risk of falls in people following stroke. Backward walking training has been reported as an appropriate therapeutic intervention to address these deficits for people following a stroke. Due to the range of benefits reported, the purpose of this systematic review was to examine the effects of backward walking training on gait parameters in people following stroke. A search of Embase, CINAHL, and PubMed databases was performed using specific search terms related to backward walking, stroke, and gait parameters. Following a defined process of title screen, abstract screen, full text screen, and application of inclusion/exclusion criteria, six articles were included in the final systematic review. Study results indicate significant evidence within the experimental groups for improvement in gait speed, step length, stride length, endurance, and balance. The findings from this systematic review indicate that backward walking training is an effective therapeutic intervention to improve gait parameters in people following stroke.

Key Words: backward walking training, stroke, gait parameters

INTRODUCTION

Walking is an important component of daily functional activities for many people, but occurrences such as a stroke may result in limitations to this activity by affecting a person's gait parameters [1]. According to the Centers for Disease Control, roughly 795,000 people in the United States experience a stroke each year with 610,000 of these classified as the first stroke and the remaining 185,000 being recurrent strokes [2]. A common result of a stroke is the negative impact on the person's gait, including an asymmetrical gait pattern, a slower cadence, and decreased stride and step lengths. These factors combine to increase the risk of falls [3],[4]. A well-structured, comprehensive rehabilitation program is necessary to address the gait deficits and reduce the risk of falls in people following stroke.

Due to its multiple benefits, Backward Walking Training (BWT) has been recommended as a therapeutic intervention to improve gait and gait parameters in people who experience a stroke. BWT involves walking backward on a smooth, level surface, incorporating hip extension with knee flexion moving toward knee extension. The biomechanics of BWT differ significantly from those of normal, forward gait. The benefits of BWT reported in the literature are numerous. First, due to the nature of the activity, the person is unable to effectively use vision and must rely on sensory inputs for joint position and foot placement. BWT has been shown to increase cerebral activation by stimulating cortical processing due to the absence of visual information and the additional sensory feedback required for motor planning of