

KINEMATIC ANALYSIS OF THE CRESCENT KICK IN TAEKWONDO

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INTRODUCTION: Taekwondo is a martial art that originated in Korea more than 2000 years ago (Kim, 1995). Presently, it is an Olympic sport and is performed in over 160 countries by approximately 50 million practitioners of all ages. Taekwondo translates to "Way of Kicking and Punching" (Kim, 1995), and as its name indicates, it is characterized as an activity where kicks compose 80 percent of the techniques. The basic kicks in taekwondo are front, crescent, roundhouse, side, back, and hook kick.

NEED FOR THE STUDY: Front and crescent kicks are considered to be biomechanically simple, since they are primarily performed in one plane of movement. However, complex kicks such as roundhouse, back, or spinning hook involve movement in three planes at the same time as the body rotates around its vertical axis. This makes identification of factors that contribute to enhanced performance difficult. It is proposed that by understanding how practitioners of different skill levels perform basic kicking techniques, insight may be gained into understanding factors that are involved in more complex kicking techniques. Few studies, considering the subjects' characteristics and skill levels as modifying factors of performance, have focused on taekwondo's basic kicking techniques. However study population characteristics such as body size, skill level and a male-female ratio of 5:1 (Birrер and Birrer, 1983), do not allow generalizations of these results to a variety of populations. No studies have been conducted on young taekwondo practitioners in spite the fact that children make up 25% of the population practicing martial arts (Zetaruk et al., 2000). Even more, taekwondo's injury rate has been reported to be 23.58 per 1000 athlete-exposures, a value close to the American football rate of 30.97 (Zemper and Pieter, 1989), an indication that practitioners are at a high risk of injuries.

PURPOSE: The purpose of this study is to describe the movement pattern of the crescent kick in taekwondo, and the effect of ground reaction forces on the velocity of the kicking limb segments. It also attempts to identify differences in performances of practitioners with various skill levels, age, and gender.

METHODS: Subjects will be healthy male and female practitioners, between 5 and 18 years of age, with no orthopedic problems that may affect their ability to perform kicks. They will be of the various skill levels, as determined by taekwondo's colored belt system. Approval for this research has been granted by the University Committee of Research Involving Human Subjects. Anthropometric, kinematic, and kinetic data on each subject will be collected.

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