

Article

A study on the relationship between students' Ice and Snow sports ability and quality of life based on sports biomechanics

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Abstract: This study investigated the relationship between students' level of competence in Ice and Snow sports and their quality of life at Heilongjiang Institute of Construction Technology. It examined the participants' profile namely gender, grade level, and program of study, assessed their level of competence in knowledge, skills, and attitude towards Ice and Snow sports, and measured their quality of life across physical, psychological, environmental, and social domains. The study also explored significant differences in competence and quality of life across participant profiles, investigated the relationship between these two constructs, and identified problems and challenges faced by students in relation to Ice and Snow sports. Biomechanical analysis reveals that regular participation enhances postural stability (ROM improvement 15%–22%) and muscle coordination efficiency (EMG variance reduction 18% ± 3%), mediating 31% of QoL improvement through physiological adaptation pathways. It employed a mixed research approach and included students and teachers as participants. Participants were selected through a random sampling technique using the Lynch formula. Results show that participants' level of competence on Ice and Snow sports is high in terms of knowledge, skills, and attitude. Additionally, they have a high level of quality of life in terms of physical, psychological, environmental, and social relationships. Based on the findings, the research proposed a plan of action to enhance both students' competence in Ice and Snow sports and their overall quality of life, aiming to provide insights for improving educational and recreational programs within the context of the Heilongjiang Institute of Construction Technology.

Keywords: sports biomechanics; competence; Ice and Snow sports; quality of life

1. Introduction

Ice and Snow sports are gaining popularity globally, particularly in colder countries, due to rising living standards and diverse lifestyles. These sports not only serve as prominent winter recreational activities but also contribute significantly to the tourism industry [1]. They offer considerable health benefits, prompting many schools to introduce related courses. These activities improve physical fitness by burning calories and enhancing muscle exercise, while also boosting mental agility and coordination through sports like skiing and ice hockey.

Psychologically, Ice and Snow sports build resilience, confidence, and patience, as they require navigating challenging environments and making strategic decisions. This enhances emotional control and endurance.

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