

UNIVERSITI TEKNOLOGI MARA

**A COMPARISON OF PERIODIZATION
MODELS FOR MUSCULAR
STRENGTH**

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ABSTRACT

Long-term strength training programmes are commonly constructed based on periodization models. The purpose of this study is to determine the more superior periodization model between; Linear Periodization (LP, n=20), Daily Undulating Periodization (DUP, n=19), and Weekly Undulating Periodization (WUP, n=19) in improving maximal strength. Fifty eight (58) recreationally trained college-aged male participants (Age: 22 ± 0.96 years; Height: 162.67 ± 7.97 cm; Mass: 61.02 ± 12.46 kg) with a minimum of 6 months strength training experience were assigned into three experimental groups. Pre and post-test measures used the Bench Press to record upper body strength and Leg Press for lower body strength. A nine (9) weeks exercise programme was implemented 3 days per week. Three (3) sets training for each exercise was prescribed. Training loads at 90% intensity of four (4) repetitions was determined as heavy, 85% intensity of six (6) repetitions for medium, and 80% of eight (8) repetitions as light. All groups showed significant improvements ($p < 0.05$) in the bench press test; 19.7% (LP), 29.1% (DUP), and 32% (WUP), and in the leg press test; 50.65% for LP, DUP at 49.6%, and WUP at 41%. Although the DUP showed the highest in overall strength improvement, statistical analysis however showed no significant differences existed between the groups ($p > 0.05$). In conclusion, all the periodization models were effective to elicit higher strength gain with the DUP showing a slight superiority in overall percentage of improvement over LP and WUP.

Keywords: Linear periodization, daily undulating, weekly undulating, bench press, leg press, strength training.

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CHAPTER ONE

INTRODUCTION

1.1 INTRODUCTION

Approaches in strength training (ST) for high-performance sports and fitness are very broad and varied. However, as the body of knowledge and experience in the area grows, recently ST programmes are advocated in a more structured and periodized approach (Prestes, De Lima, Frollini, Donatto, & Conte, 2009a). ST programmes advocating the periodization model was first popularized by the Eastern Bloc, particularly in Russia and the former East Germany (Graham, 2002). Access to this knowledge was then exported through the migration of sport scientists from the Eastern Bloc to the West, in example Tudor O. Bompa, who authored the best-selling training book, *Theory and Methodology of Training*.

To achieve the desired goal of enhanced high performance physical capability, specific ST programmes are implemented in a periodized manner. However, this concept may be problematic and controversial when access and great source to the best periodization model are limited or when sport coaches or strength-conditioning professionals perceive that they have limited scientific evidence to choose and apply the most suitable and superior periodization model to their athletes' ST programmes. Thus, the identification and application of the best periodization model that promotes effective, whilst varied, physical fitness adaptations to the human body and faster strength gain would significantly contribute positively to sport coaches, strength conditioning specialists and professionals (Kraemer & Fleck, 2005).

The design of ST programmes are mainly aimed at utilising and improving many aspects of physical performances, especially across multiple fitness components focused on cardiovascular fitness, muscle strength, muscle mass, and body composition (Alcaraz, Perez-Gomez, Chavarrias, & Blazevich, 2011). Based on scientific evidences and research, ST programmes also resulted in increasing performance and enhancing the value of both physical health and fitness (Kraemer, Adams, Cafarelli, Dudley, Dooly, Feigenbaum, Fleck, Franklin, Fry, & Hoffman, 2002). In reference to previous studies, traditional ST programmes require a