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Drop Set Continuum Zone Repetition Strategies on the Recovery Week Periodization

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A B S T R A C T

Objective: The study goal was to investigate of perform strength and hypertrophy zone drop set sessions on low and high load frequency muscle fibril effort in recovery week periodization.

Methods and Materials: The muay thai athletes; n= (14), age (14.42±1.50), height (166.85±10.75), body mass (61.92±10.73) participated over 3 week and per week 2 days drop set program. High load drop set performed including at 70-90% of 1RM loading range on 3-4 set-ups finish with non-rest interval. Muscular performance efforts of subjects were displayed on selecting multi-parameter maximum absolute and relative strength and repetition maximum protocols: (moderate frequency=70% of 1RM unfatigued muscle contraction and (high frequency= 85% of 1RM muscle fibril composition).

Findings: In the results, one repetition maximum (1RM) was concluded on seated leg curl (p=0.017; 11.14%), leg extension (p=0.000; 16.28%), however, local muscular endurance on leg press (p=0.024; 23.85%), seated leg curl (p=0.013; 15.35%), addition, muscle fibril composition on leg press, seated leg curl and leg extension has not significant differences.

Conclusion: The drop set combination related repetition maximum strategies can be used to longer week maximize muscular performance, Tapering period and enhanced muscular endurance adaptation.

Keywords: Plyometric Training, Explosive Power, Sprinters, Athletic Performance, Muscle Strength, Speed, Agility, Psychological Benefits, Training Efficiency.

1. Introduction

Over the years, resistance training performance strategies provided muscular strength and endurance exercise condition for high individual strength performance gain of highly resistance training population (1). The primary opportunity to maximize strength performance and repetition continuum alleviates single training sessions during multi-joint weight-lifting tasks (2). Going offline with periodic setups consisting of micro-training segments completed the resistance-improving performance. In the last decade, modes consisted of single and multiple joint tasks (3). Single- and multi-joint tasks are ideally modified for

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loading increases in continuum repetitions of progressive resistance, such as strength, hypertrophy, and muscular endurance zones (1, 4). Specifically, resistance training strategies are yielded of continuum zone repetition or repetition maximum or maximum number of repetition for evaluate multiple resistance condition as "delorme method" enable both metabolic and mechanic muscular adaptation with load factors by weekly low and high frequency changes short time wave-like mesocycle periodization (5, 6). It is known that resistance training periodization processes compared to continuum zone repetition performed on one linear maximum strength performance level, developing high load change and single set session (7, 8). Resistance training condition was reported that previously repetition maximum strategies on 3-5RM explosive strength and 5-8RM explosive power for planning of maximum strength adaptation (8). However, delorme method as high load frequency 1-5RM strength zone planned on periodic strength, hypertrophy and local muscular endurance (5, 9). Strength zones gradually transition promoted on low and high load frequencies of weekly undulation model periodization (9). The muscular strength performance levels, therefore, has been aimed that muscle fibril composition on high load frequency work whereas low load frequencies promote increased composition muscle mass (10). In this case, high load resistance training periodization without, drop set bi-weekly non-linear periodization was reflected continuum zone repetition working strategies (11, 12). Unlikely, drop set high load resistance training performances enhance low and high load strength adaptation within repetition number change at range optimal 10-15% intensities (11, 12). However, drop set was uncleared to continuum zone repetition on high load strength zone 1-5RM, moderate load hypertrophy zone 8-12RM and low load local muscular endurance +15RM (5, 13). Then, high load drop set used in 80% of 1RM with 4 decreased single set enhancing range working principle as 30% loading local muscular endurance strategy (14). The drop set explained on high strength periodic plan included in lower leg performance performing of 75% of 1RM to 55% of 1RM local muscular endurance as optimal 20% loading range (12), however, drop set linear loading decrease may be on 75% of 1RM moderate volume changes promote muscular strength adaptation (15). In this direction, high load combined to low load preferred to maximize adaptation (16). For drop set training volume decrease and increase respectively, 90% of 1RM strength zone combined 25-35RM local muscular endurance zone commonly developed maximize strength (17). Accordingly, drop set resistance training periodization have been worked before frequencies of training working stage, therefore our study goal was to increase high muscular strength performance enhancement performing of drop set recovery week resistance training periodization-based continuum zone repetition strategies in muay thai athletes.

2. Methods and Materials

2.1 Experimental design

The research in muay thai athletes investigated as experimental study. To ensure all participants initiated the study were required to complete 1-2 week pre and post measurement. Participants were assessed (pre) and following 3 weeks of training (post). All testing occurred during a standard time of day (between into 24 hour). Assessments included anthropometry, one repetition maximum (1RM), low and high load frequency muscle fibril effort. The 3 week resistance training program (2 session week^{-1}) was performed under the direct supervision of 2 training specialists.

Table 1. Descriptive properties

Variable	Mean (SD)
Age (y)	14.42±1.50
Height (m)	166.85±10.75
Body mass (kg)	61.92±10.73
Training experience (y)	1.12±1.46

2.2 Participants

The n=14 trained and active (effect size=1.05, alpha power= 0.95 in G.Power analysis outcome), women and men muay thai athletes participated in muay thai training regularly at least 1 years. Physical limitations (determined by medical ethic) were recruited to participate in a study, before 3 week resistance training program joining, all procedures, risks and benefits associated with the study were provided to each participant and written informed consent.

This investigation approved by Akdeniz University Medical Ethics Committee (No: TBAEK-308/2024).

2.3 Procedure

The drop sets were performed on short time bi-weekly non-linear continuum zone strength-hypertrophy zone strategies over 3 week and per week 2 days. The resistance training exercises on isotonic machines (Esjimsport/Impulse Exoform) included in a) *leg press*, b) *seated leg curl*, c) *leg extension* (Figure 1). Drops linearly on 3-4 set and including 3-minute inter-multiple set rest interval and each drops executed at non-rest interval. Drop sets were performed at range optimal 10-20% loading decrease within 48 hour, at 19:00/22:00 (Figure 2) (18).

Figure 1. Exercise condition

Respectively resistance condition, muscular fibril effort protocols included in one repetition maximum 1RM associated with F(kg)/body mass, moderate frequency high maximize repetition 70% 1RM local muscular endurance for contraction potential and high frequency 85% 1RM for determine muscle fibril composition. 1RM resistance load intensity before drop set resistance training was determined into one week test protocols, again 1RM warm-up initially started at 10 min dynamic-isometric contraction and static-concentric contraction stretching for resistance session and set-up formation. Then, estimated initial loading lift to perform 1RM experimental procedure was performed on initial load at estimated 50% 1RM (10 rep) for actual test condition added kg by pinch points, gradually loading tasks were performed on 80% 1RM (5 rep), then 100% 1RM (+3 rep). After 1RM day, other experimental condition into one day, local muscular endurance was performed to high repetition maximum at 1 set session. To estimate muscle fibril composition was performed as many as repetition as possible in single set attempt based <7 rep mostly fast twitch dominant, 7 or 8 mixed fiber type and >8 slow twitch dominant.

Table 2. Drop set resistance training

1. DAY	80% 1RM	2. DAY	90% 1RM
	8 rep		5 rep
	70% 1RM		70% 1 RM
	12 rep		12 rep
	3 min rest interval		3 min rest interval
	3 SET		4 SET

2.4 Statistical analysis

Statistical primer analyses are mean and standard deviation resolved in SPSS (version 22; Chicago, Illinois, US). The sample population were determined on G. Power statistical analysis program. As this analysis actual power 0.95, ES= (≥1.08) for 14 muay thai athletes. The normality Levene test was analyzed before pre-posttest measurement. The hypothesis test comparison for muay thai athletes conducted on Paired-T test analysis after normality test at p>0.05. Other descriptors analysis effect size interaction resolved on based small effect size 0.20, moderate effect size 0.50 and large effect size 0.80 (19).

3. Findings and Results

Drop set resistance training periodization was performed on short term recovery periodization. Continuum zone repetition strategies were determined on results to maximize strength; leg press (p=0.507; t=-0.682; ES=trival), seated leg curl (p=0.017; t=-2.729; ES=0.65), leg extension (p=0.000; t=-4.837; ES=1.14) in Table 3.

Table 3. Maximize strength

Variable	Pre	100%1RM	Post
	Mean ±SD	Δ%	Mean ±SD
LEG PRESS		2.35	
Absolute	81.57±21.67		83.92±24.24
Relative	1.31±0.25		1.34±0.25
SEATED LEG CURL		11.14*	
Absolute	51.85±18.09		63.00±15.66
Relative	0.83±0.23		1.01±0.17
LEG EXTENSION		16.28**	
Absolute	58.50±16.19		74.78±11.78
Relative	0.93±0.16		1.21±0.15

Localize muscular endurance was detected on leg press (p=0.024; t=-2.250; ES=1.06), seated leg curl (p=0.013; t=-2.886; ES=0.82), leg extension (p=0.462; t=0-.759; ES=trival). Muscle fibre composition was detected on leg press (p=0.613; t=-0.518; ES=trival), seated leg curl (p=0.739; t=-0.341; ES=trival), leg extension (p=0.099; t=1.778; ES=trival) in Table 4.

Table 4. Repetition maximum

Variable		Pre		Post
	1RM	Mean ±SD	Δ%	Mean ±SD
LEG PRESS	70%	30.35±15.01	23.85*	54.21±27.96
	85%	14.92±10.31	1.85	16.78±12.09
SEATED LEG CURL	70%	16.21±10.16	15.35*	31.57±24.22
	85%	13.78±10.45	0.71	14.50±11.07
LEG EXTENSION	70%	16.14±11.70	3.50	19.64±14.47
	85%	13.78±6.10	-3.50	10.28±5.16

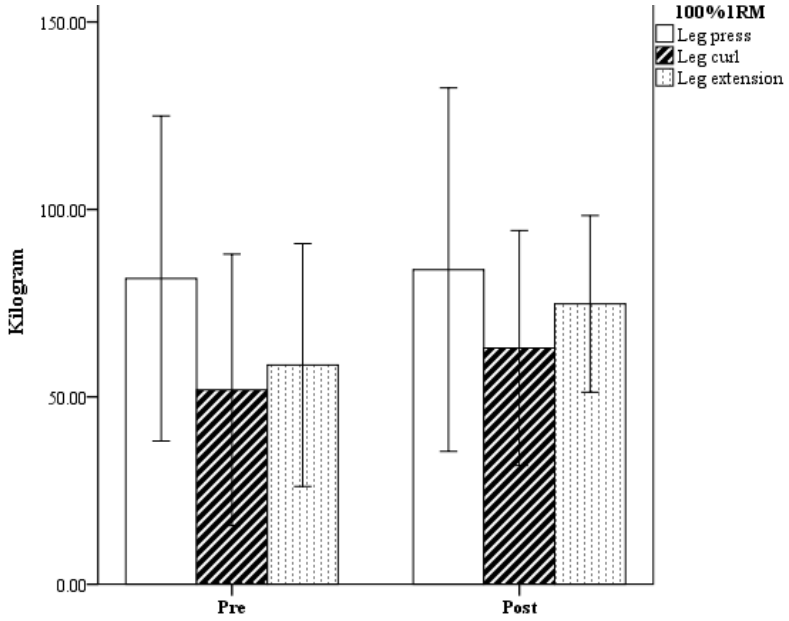

Figure 2. Drop set; maximal strength output

4. Discussion and Conclusion

Non-traditional resistance training studies were reported that drop set resistance training not used on short term non-linear recovery week muscular strength periodization (12, 13, 15, 16). Therefore, the muscular strength performance level may be one set and/or multiple set session, the drop sets for the maximum number of repetition change on short and/or long time strength periodization, again non-linearly loading intensity set-up may be current strength periodization (5, 7, 12, 13). Our study noted that drop set resistance training was developed high strength muscular regional force increases on muscular performance level by performing on high load strength zone (90% of 1RM) contrast to moderate load hypertrophy zone (<80% of 1RM), however, other approach was reported, similar muscular strength effects may be produced on moderate loading – (6-15RM) hypertrophy zone contrast to low loading – (15-40RM) local muscular endurance zone. Whereas, normally load performance program must be on 70% 1RM and 75% 1RM moderate load volume change without planning of continuum zone repetition hypertrophy strategies enhance normalize muscular strength performance (1, 15). Similarly, hypertrophic muscular strength effect would be seen indeed in low load (30% 1RM), high load (80% 1RM), and to drop sets, whereas the muscle fibril composition has been increased to all strength condition, to muscular endurance elevation may be perform on 30% 1RM by maximum number of repetition (Ozaki et al., 2018). In this study, the drop sets has been increased muscle fibril efforts as these low and high frequency loading volume changes. Load lifting intensity drop set performance sessions were planned on optimal volume ranges at 20% load decrementally to perform one set session, increasing muscular strength and endurance response on drop set resistance training may be repetition maximum increase periodization (7, 12). For this reason, loading intensity ranges using of drop set, one set load repetition zone performance ie., strength zone enhances muscular local endurance by 10% and 30% loading volume range as well as developing on muscle strength performance increase (14). Thus, continuum zone repetition strategies, for example; maximal strength in (1-5RM), maximal hypertrophy in (8-12RM) and maximal muscular local endurance in (+15RM) properly maximum repetition change and single set plan on exercise and strength condition (5). Currently, drop set recovery week periodization was determined that high and low load volume and repetition frequencies to muscular strength and endurance gain (11, 15). However, maximize muscular strength efforts were clarified other research, on high load (80% 1RM and 85% 1RM) strength zone not similar effect to high muscle performance gain (4, 15). High load >80% 1RM decreases drop set performance not used for multiple exercise condition, as well as showed on the continuum zone repetition was non-periodic recovery week periodization to single set repetition number maximum strength effort (14). In this condition, the continuum zone repetition load

decremental intensity strategy was determined on this drop set resistance training study, in this case, strength condition ie., strength and hypertrophy zone strategies were used to highly performance change for muscular strength adaptation, again properly planned on maximize strength and endurance performance gain.

The drop set resistance training is current muscular strength and endurance performance gain on short time recovery week periodization, indeed our reported that single set or multi set drop set resistance training develop high and low load frequence changes, however, limitation to our study, is that the non-linear recovery week drop set resistance training periodization was currently not applied muscular strength and endurance performance level in muay thai athletes. Addition, research was formed to deload volume determination before other resistance training, short term program not used to muay thai athlete or other sport performance population.

Authors' Contributions

Y.K. conceptualized the study, designed the research methodology, and supervised the implementation of the drop set program. A.H. conducted the literature review, facilitated the recruitment process of the muay thai athletes, and ensured the accuracy of data collection. A.Ş. performed the statistical analysis, interpreted the results, and contributed to drafting the manuscript. İ.V. managed data transcription, organized the experimental sessions, and reviewed the manuscript for critical intellectual content. S.T. assisted in the execution of the drop set training sessions, managed the equipment and setup, and participated in data analysis. All authors participated in discussing the findings, critically reviewed the manuscript, and approved the final version for publication

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. This investigation approved by Akdeniz University Medical Ethics Committee (No: TBAEK-308/2024).

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