SCIENTIFIC JOURNAL OF SPORT AND PERFORMANCE

ORIGINAL ARTICLE

Investigate of unsimilar effect of longer rest interval in multiple sets by performing deload repetition training regimes to micro strength gain change on light weeks of weightlifters

Yeliz Kahraman . *Movement and Training Department. Akdeniz University. Turkey.*
İsmail Varol. *Sport Science Faculty. Akdeniz University. Turkey.*
Atilla Şahan. *Sports Management Department. Mehmet Akif Ersoy University. Turkey.*
Aykut Hocalar. *Movement and Training Department. Akdeniz University. Turkey.*

ABSTRACT

Continuum zone repetition training strategies are one of repetition manipulation both multiple set and repetition zone periodization on weightlifters. The present study was aimed to strength level on weightlift exercise condition of weightlifting athletes, deload repetition resistance training regimes involved in proper rest interval and repetition range by performing multiple set and longer rest interval within different maximize performance on light weeks. The experimental study was conducted to 2 olympic, 1 national, 6 professional weightlifters participated on age (16-21 years) this study. With study maximize performance condition over 3 week resistance training finished to weightlifters. Priority experimental pre-test and post-test outcomes after resistance training showed significant different (p < .05) in dynamic strength to countermovement jump shrug (p = .035; d = 0.69; = 17.78%). However, significant different in low load repetition failure to overhead press (p = .007; d = 0.86; = 5.56%), high load repetition failure to bent-over row (p = .017; d = 1.14; = 8.00%), low and high load repetition failure to countermovement jump shrug (p = .017; d = 1.17; = 13.78% - p = .048; d = 0.73; = 5.44%), in localize endurance not significant performance level to resistance exercise performance. However, isometric strength detected to overhead press (p = .016; d = 1.30; = -0.72%), bent-over row (p = .012; d = 1.67; = -0.51%) and countermovement jump shrug (p = .004; d = 2.45; = -0.48%) in weightlifters. Unsimilar longer rest interval multiple set configuration suggested to maximize strength gain on short time deload repetition training regimes by manipulated repetition and set addition rest interval currently manipulation of weightlifters.

Keywords: Performance analysis, Longer rest interval, Deload repetition, Light weeks, Weightlifters.

Cite this article as:
Kahraman, Y., Varol, İ., Şahan, A., & Hocalar, A. (2024). Investigate of unsimilar effect of longer rest interval in multiple sets by performing deload repetition training regimes to micro strength gain change on light weeks of weightlifters. *Scientific Journal of Sport and Performance*, *3*(3), 291-301. https://doi.org/10.55860/RJKO3098

Corresponding author. *Movement and Training Department. Akdeniz University. Turkey.*
E-mail: yelizkahramana@hotmail.com
Submitted for publication February 03, 2024.
Accepted for publication March 04, 2024.
Published April 16, 2024.
Scientific Journal of Sport and Performance. ISSN 2794-0586.

doi: https://doi.org/10.55860/RJKO3098

INTRODUCTION

Olympic weightlifting performances consists of snatch and jerk lifts, then the snatch performance sweeping motion into an overhead and locked position of simultaneously extension of legs whereas jerk performance initially weight raised from the floor to chest and locked position above the head. Both performances included arm, back and leg speed and strength in a short time in this direction general exercises primarily to develop speed and strength during training phase in the joint torque pattern correlated with other performance levels associated with various segment strength and maximum load lifting (Shetty, 1990). Furthermore, performance level of weightlifters do not change on one repetition maximum of derivatives with other general exercise conditions (Soriano et al., 2020), therefore multi joint continuum zone repetition resistance training strategy is a resistance load and repetition manipulation but such manipulated strategies have not been investigated in the relationship between general load and rest interval (Aycan et al., 2023; Kraemer and Ratamess, 2004). The current approach is that continuum zone repetitions are a more effective resistance training regimes for strength gain, unlike general training adaptation (Schoenfeld et al., 2021). A study conducted in this direction showed that deload repetition ranges are constant zone working principle for linear strength development whereas differently zone working for micro strength level (Aycan et al., 2023). The study reported deloading repetition ranges formed on constantly strength zone <5RM, hypertrophy zone 8-12RM, and local muscular endurance >15RM (Schoenfeld et al., 2021). However, occupational access to maximal strength performance level is not limited to just one zone, strength adaptations are also achieved through switching to other zone working principle (Aycan et al., 2023; Schoenfeld et al., 2021). Indeed, general resistance training regimes in this direction should reflect both metabolic and mechanical strength gain (ACSM, 2009).

Popular studies to the resistance efforts of individuals have striven to reach maximize strength between repetition and rest interval created to ensure metabolic adaptation (Campos et al., 2002; ACSM, 2009; Kraemer and Ratamess, 2004). Namely, the principle of working in zones included 3 to 5 minutes of rest interval in both metabolic <60% of 1RM and mechanic >60% of 1RM strength adaptations enable to high load maximal strength efforts (Campos et al., 2002; Schoenfeld et al., 2021). Similarly, manipulated higher load is effort of load repetition relationship between different repetition and multiple set to metabolic and mechanic stress factors by 3 and 5 min versus 1 min of rest interval between manipulated certain sets (de Salles et al., 2009; de Camargo et al., 2022). Training actual goal was provided reaching of maximal strength, 1 min rest interval occupational method to between maximal repetition and repeated attempt, however 3 and 5 min rest interval promote safe and reliable manipulation of resistance training regimes (de Salles et al., 2009). Resistance training manipulation load combination sets with short intervals of 30 and 60 s promote speed strength activities on strength adaptation in short time (de Camargo et al., 2022). Resistance training regime with short rest intervals between 20 s and <1 min able to higher load repetition maximum, however, total maximum repetition indicated that specific loading combination of resistance training performed on longer rest interval properly longer periodization (Hill-Haas et al., 2006). Also, maximum number of repetition both short and long rest interval related to constant endurance zone working, again short rest interval utilized to enhance muscular endurance performance level (Willardson et al., 2006).

Follow-up short rest interval <1 min maintained during multiple 3 and 4 sets when resistance training high volume, however, longer rest interval >2 min progressively increased strength performance level for example back squat vs bench press maximum loading repetition accomplished (Schoenfeld et al., 2016). In generally, load repetition regimes within <90 of 1RM was used to multiple sets (2 and 5 set) progress maximum number of repetitions to per set evaluated on 3 and 5 min rest interval to short time periodization not cleared on different resistance training zones (Mangine et al., 2015; Grgic et al., 2018). On the other hand, load repetition

regimes at <85 of 1RM repeated multiple set loading to hypertrophic effect contributed by 30 and 60 s short rest interval between alternative and hypertrophy sets similarly greater adaptation in intervals 20 s short rest in drops allowed to muscular endurance working on fatigue accumulation (Krzystofik et al., 2019). In this traditional resistance manipulation, both rest interval and multiple set not performed on deload repetition training regimes separately in resistance training zones, thus it was deemed necessary to examine unsimilar effect of deload repetition change training regimes in light and recovery weeks maximizing strength gains to predict strength performance level of non-periodized undulation weekly periodization on weightlifters.

METHOD

Study design and subjects

Study problem on experimental approach of resistance training periodization conducted to different rest interval and multiple set develop strength performance level performing deload repetition training regimes on zone working of multi joint exercises (Fig 1). Thus, rest interval and multiple set training manipulations are one of continuum zone repetition strategies performing different repetition zone and multiple set relationship on maximizing of strength, repetition failure, localize endurance and isometric strength. The experimental test condition was determined on strength performance level of weightlifters over 3 week and 2 days short time non-periodized undulation weekly strength zones: 1-5RM; hypertrophy zone: 8-12RM and endurance zone: +15RM to represent deload repetition implementation on different training regimes. In this condition, resistance training regimes were tested on pre-training and post-training tests to perform overhead press, bent-over row, deadlift, countermovement jump shrug maximize strength performance level, proper failure trial and voluntary fatigue to weightlifters in Turkey. For this reason, 2 Olympic men, 1 national men, 4 professional men and 2 national women weightlifters participated in this study. Permission health condition report and acceptance of resistance training permission acceded in Akdeniz University Medicine Ethic Committee Protocol: TBAEK-62/2024.

Table 1. Descriptive characteristics of the weightlifters.

Sample size (n)	Age (y)	Height (cm)	Weight (kg)	WL training experience (y)
9	17.88 (1.61); 16-21	170 (0.08)	72.66 (10.90)	5.27 (2.56)

Note. WL; weightlifting, data presented as mean (SD); range.

Figure 1. Multi joint exercises.

Procedures

Maximal strength

Priority maximal strength testing of both metabolic and mechanic adaptation of resistance training completed on one repetition maximum test (1RM), National Strength and Conditioning Association guidelines carried out adhering to recognized training repetition range to properly execute multiple set and maximum number of repetitions. Subjects were performed 10 min warm-up to each resistance multi joint exercises; overhead press – weightlift platform on shoulder level, bent-over row – barbell free on hip level, deadlift – barbell free on lower knee level, countermovement jump shrug – barbell free on hip level started standard dynamic and static muscle strength efforts before 1RM test trials, then subjects performed 1 minute short rest interval. While testing their strength increases, the upper and lower compartment muscle strength testing performed using added by 5-10 kg incrementally at reaching 90-100% of 1RM maximal strength. However, their compartment muscle strength were performed on 50% of 1RM - (10RM), 70% of 1RM - (5RM), 90% of 1RM - (3RM) and 100% of 1RM - (1RM) using of weightlifting strength platforms.

Repetition failure

Maximal number of repetitions on muscular non-failure test condition was achieved both low load 30% of 1RM and high load 80% of 1RM to detect on maximum repetition of zone loading after general weightlifter warm-up. During low load of 30% of 1RM, which consists of maximum repetitions by 3-minute rest was given, and then there were asked to warm up speed performance for 5 repetitions of 50% of 1RM and 3 repetition of 75% of 1RM between 3 min rest intervals. For the maximum number of repetition high load test performed on 80% of 1RM. Then, the loading repetition was low and high load the failure repetition maximum range occurred on single set repetition. At the beginning of loading repetition maximum, 3, 2, 1, start was given to repetition totally recorded during the strength phase.

Localize endurance

Constant strength-endurance zone performance level involves endurance practices in a continuity of repetition maximum in order to determine of voluntarily muscle fatigue detection in determining the load and repetition constant manipulation when submaximal absolute endurance resistances used to train regimes short time periodization. Accordingly, repetition maximum of localize endurances was detected initially loading increase at 10 repetitions of 50% of 1RM warm-up to strength-endurance performance level in ranges of 70% of 1RM absolute load performed on multi joint exercises from 1 set finish.

Isometric strength

Strength-force phases were determined to optimize strength performance level provide peak concentric phase reaches were produced on isometric late period curve; $\Delta load$ / $\Delta time$ within high load sessions were estimated on 90% of 1RM after 5 repetitions of 75% of 1RM. All of each strength/force phases performed on time trials to using standard time calculator lab accomplished 1 repetition set trial.

Resistance training periodization

Resistance multi joint exercise deload repetition training periodization composed of continuum zone repetition ranges periodized consecutively light weeks to overloading increase to finish moderate loading training with loading on werksan platform. Loading repetition program was assigned increasing load while keeping repetition range change on decrease. Developing strength performance level of multi joint conducted on respectively; a) overhead press, b) bent-over row, c) deadlift and d) countermovement jump shrug performance performing low load - endurance zone, moderate zone - hypertrophy zone and high load - strength zone generally optimal training load 75% volume manipulation to each resistance training regimes were performed on daily combinations of endurance, hypertrophy and strength zones after initial 30% of 1RM

– 10 repetition then 50% of 1RM – 5 repetition warm-up within different longer rest interval and multiple set. Exploring of constant training regime efforts on different sets and rest intervals, however deload repetition working performed on rest interval <1 min only to perform single zone working over 3 week and 2 days per week within consecutively days.

Table 2. Resistance training periodization in deloading repetitions.

1-2. Day 1.Week	3-4. Day 2.Week	5-6.Day 3.Week
Endurance zone	**Endurance zone**	**Endurance zone**
60% 1RM	60% 1RM	60% 1RM
15RM	15RM	15RM
3 set	3 set	3 set
3 min rest	5 min rest	3 min rest
Hypertrophy zone	**Hypertrophy zone**	**Hypertrophy zone**
75% 1RM	75% 1RM	75% 1RM
8RM	8RM	8RM
2 set	2 set	2 set
5 min rest	3 min rest	5 min rest
Strength zone	**Strength zone**	**Strength zone**
90% 1RM	90% 1RM	90% 1RM
<5RM	<5RM	<5RM
1 set	1 set	1 set

Statistical analysis

Priority outcomes of resistance training were evaluated on descriptive mean, standard deviation, confidence interval and effect size (*d*). Normality condition Levene statistic provided to comparison of pre and post-test measurement. Pre and post measurements tested on Paired- T test statistical analysis. A priority t-test matched pairs was computed to sample size (n = 9), actual power 0.98, probability α error 0.05 to determine one measurement outcome effect size d = 1.54 in significant alpha level p < .05 (G.Power.3.1.9.7.). Descriptive analysis provided on small effect .20, moderate effect .50 and large effect >.80.

RESULTS

Dynamic strength performance level produced on overhead press (t = -2.256; CI% = -15.72 – 0.17; p = .054), bent-over row (t = -0.577; CI% = -16.64 – 9.98; p = .580), and deadlift (t = -0.189; CI% = -7.33 – 6.22; p = .855), countermovement jump shrug (t = -2.530; CI% = -33.98 – -1.57; p = .035*; d = 0.69).

Table 3. Dynamic strength performance level.

	Pre	**∆%**	**Post**
	Mean (SD)		**Mean (SD)**
Overhead press *kg.kg*$^{-1}$	57.77 (16.22) 0.79	7.78	65.55 (20.53) 0.89
Bent-over row *kg.kg*$^{-1}$	144.44 (31.26) 1.99	3.33	147.77 (24.38) 2.03
Deadlift *kg.kg*$^{-1}$	151.11 (30.18) 2.08	0.06	151.66 (31.22) 2.08
Countermovement jump shrug *kg.kg*$^{-1}$	117.77 (30.32) 1.62	17.78*	135.55 (19.43) 1.87

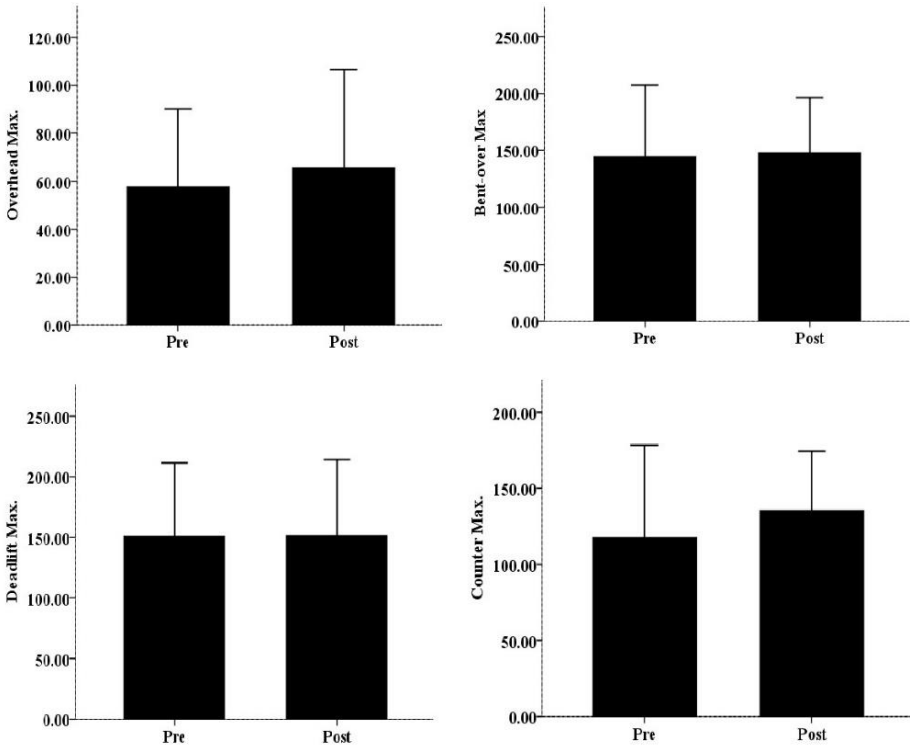

Figure 2. Dynamic strength pre and post-test outcomes showed on overhead press, bent-over row deadlift, countermovement jump shrug performance level. These outcomes only moderate effect significant difference was concluded on countermovement jump shrug between maximal tests.

Repetition failure performance level produced on overhead press to low load (t = -3.613; CI% = -9.10 – -2.00; *p* = .007**; *d* = 0.86), and to high load (t = -1.681; CI% = -4.47 – 0.70; *p* = .131), bent-over row to low load (t = -0.913; CI% = -12.14 – 5.25; *p* = .388), and to high load (t = -2.994; CI% = -14.16 – *p* = .017*; *d* = 1.14), deadlift to low load (t = -2.158; CI% = 15.62 – 0.51; *p* = .063), and to high load (t = 0.512; CI% = -3.11 – 4.89; *p* = .622), countermovement jump shrug to low load (t = -3.003; CI% = -24.35 – -3.19; *p* = .017*; *d* = 1.17), and to high load (t = -2.339; CI% = -10.81 – -0.07; *p* = .048*; *d* = 0.73).

Table 4. Repetition failure performance level.

	Pre	∆%	Post
	Mean (SD)		Mean (SD)
Overhead press			
30% rep	42.88 (6.66)	5.56**	48.44 (6.18)
80% rep	10.66 (4.52)	1.89	12.55 (4.27)
Bent-over row			
30% rep	43.77 (12.27)	3.44	47.22 (14.71)
80% rep	6.33 (2.91)	8.00*	14.33 (9.47)
Deadlift			
30% rep	27.55 (9.48)	7.56	35.11 (9.47)
80% rep	9.88 (3.88)	-0.89	9.00 (3.93)
Countermovement jump shrug			
30% rep	21.22 (7.24)	13.78*	35.00 (14.89)
80% rep	11.77 (4.52)	5.44*	17.22 (9.41)

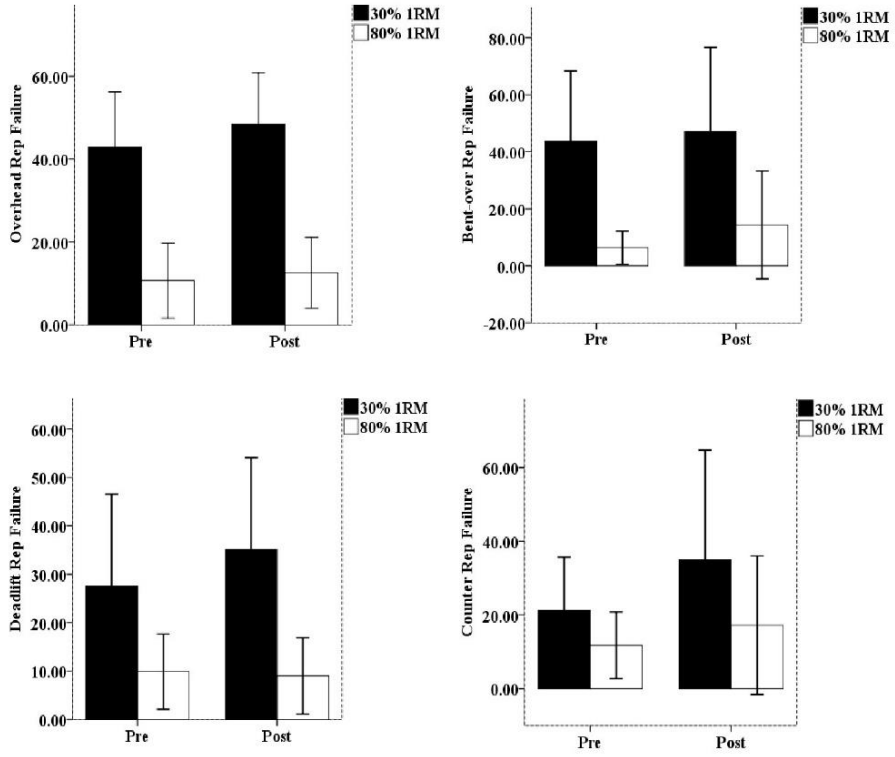

Figure 3. Repetition failure pre and post-test outcomes showed on overhead press, bent-over row deadlift, countermovement jump shrug performance level. These outcomes both low and high load moderate and large effect significant difference was concluded on overhead press, bent-over row and countermovement jump shrug between repetition failure tests.

Table 5. Localize endurance performance level.

	Pre	∆%	Post
	Mean (SD)		Mean (SD)
Overhead press			
70% 1RM max	17.11 (5.27)	-0.33	16.77 (8.72)
Bent-over row			
70% 1RM max	11.11 (4.34)	6.78	17.88 (13.25)
Deadlift			
70% 1RM max	12.00 (3.31)	0.22	12.22 (6.03)
Countermovement jump shrug			
70% 1RM max	13.11 (4.96)	7.56	20.66 (12.39)

Localize endurance performance level produced on overhead press (t = 0.098; CI% = -7.52 – 8.19; *p* = .924), bent-over row (t = -1.661; CI% = -16.19 – 2.63; *p* = .135), deadlift (t = -0.122; CI% = -4.42 – 3.98; *p* = .906), countermovement jump shrug (CI% = -17.60 – 2.48; t = -1.734; *p* = .121).

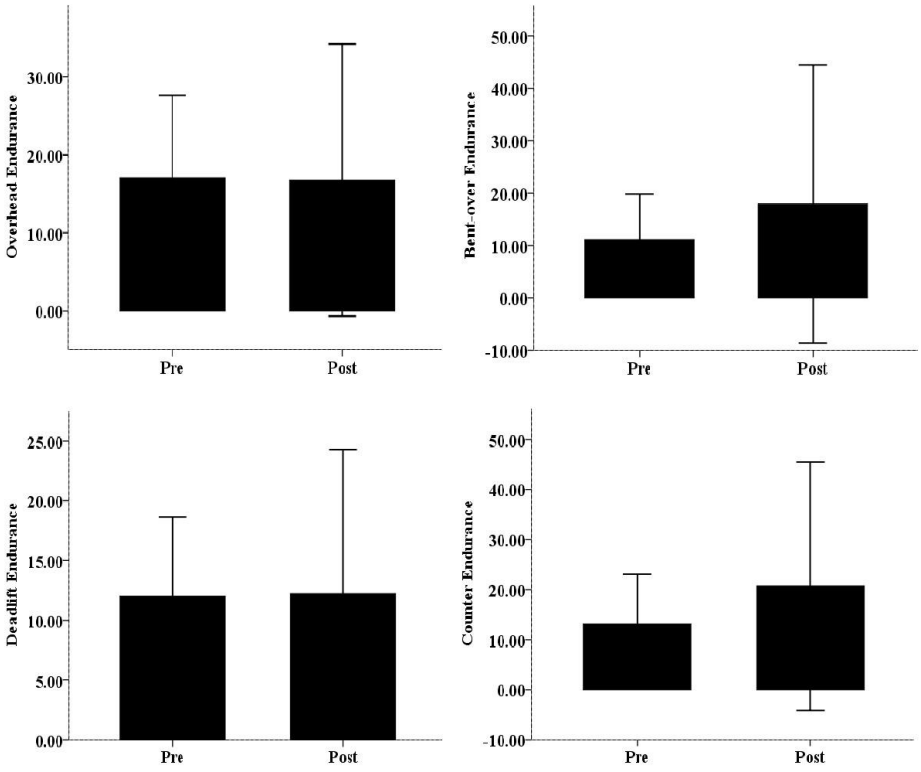

Figure 4. Localize endurance pre and post-test outcomes showed on overhead press, bent-over row deadlift, countermovement jump shrug performance level. These outcomes not significant differences.

Table 6. Isometric strength performance level.

	Pre	Δ%	Post
	Mean (SD)		Mean (SD)
Overhead press			
90% t	1.96 (0.71)	-0.72*	1.24 (0.32)
Bent-over row			
90% t	1.51 (0.36)	-0.51*	1.0 (0.25)
Deadlift			
90% t	2.16 (0.52)	-0.50	1.66 (0.62)
Countermovement jump shrug			
90% t	1.23 (0.21)	-0.48**	0.75 (0.18)

Isometric strength performance level produced on overhead press (t = 3.027; CI% = 0.17 – 1.26; p = .016*; d = 1.30), bent-over row (t = 3.227; CI% = 0.14 – 0.88; p = .012*; d = 1.67), deadlift (t = 1.980; CI% = -0.09 – 1.08; p = .090), countermovement jump shrug (t = 3.956; CI% = 0.19 – 0.75; p = .004**; d = 2.45).

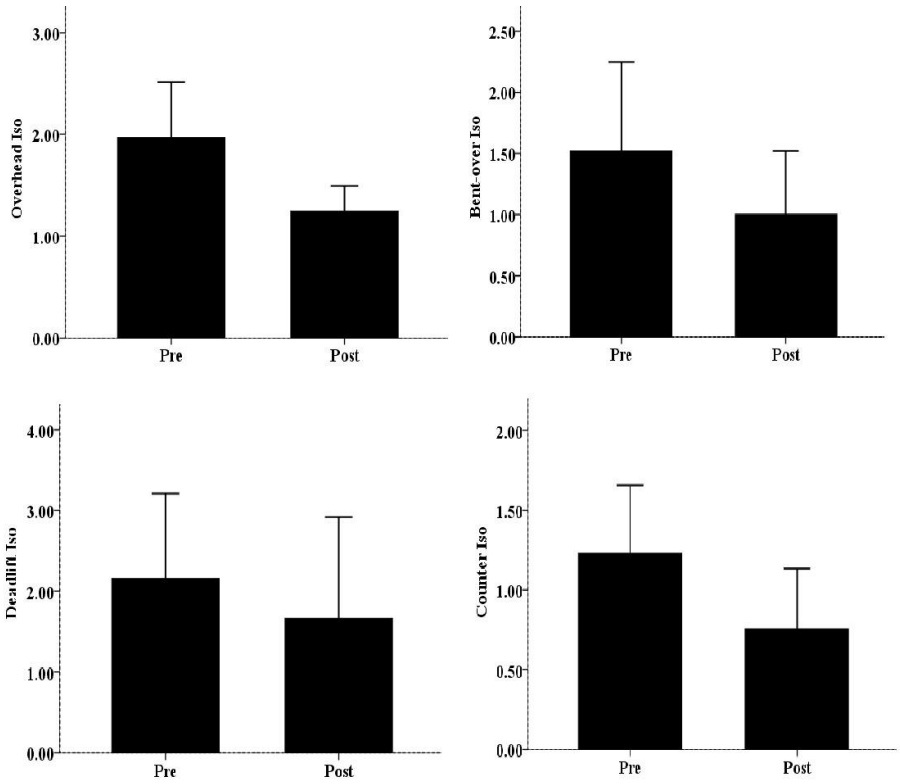

Figure 5. Isometric strength pre and post-test outcomes showed on overhead press, bent-over row deadlift, countermovement jump shrug performance level. These outcomes large effect size significant difference was concluded on overhead press, bent-over row and countermovement jump shrug.

DISCUSSION

Provable outcomes of deload repetition training regimes improving heavy overloading manipulation repetition strategy investigated in our study was similarly outcomes to multi joint strength zone heavy load working resistance training both 1 and 3 min intervals are rest interval manipulation (Aycan et al., 2023; Schoenfeld et al., 2021). Training overloading deload repetition regimes in terms of high repetition constant set strategy promote high strength and endurance performance. Currently, studies reported that loading interval ranges associated with deload repetition highly showed strength adaptation enable to maximal strength, isometric strength and localize endurance (Aycan et al., 2023). The report study noted that training regimes can overloading progression in strength zone >80% 1RM, hypertrophy zone >60% 1RM and endurance zone <60% 1RM (Schoenfeld et al., 2021). However, deload repetition training regimes unpopular to rest interval ranges of multi joint continuum zone repetition resistance training (Aycan et al., 2023). Training regimens in this direction should reflect both load and rest interval manipulation (ACSM, 2009). Critic outcomes of resistance efforts of individuals performed on both deload repetition and rest interval to provide metabolic limitation (Campos et al., 2002a). Therefore, resistance working principle included in 3 to 5 minutes of rest interval resulted on both <60% of 1RM and >60% of 1RM (Campos et al., 2002). Our study, similarly, training regime limitation manipulated working low load and high load efforts performing deload repetition range over 3 and 5 min versus 1 min of rest between sets (de Salles et al., 2009). Training goal of our study provided that reaching of maximal strength methods to repeated attempt promoted on 3 and 5 min rest interval (de Salles et al., 2009). However, training load manipulation of resistance training combination sets promote speed strength outcomes with <1 min rest interval (de Camargo et al., 2022). For one training regime with

short rest intervals <1 min used to higher load repetition maximum, however, our study supported that deload repetition resistance training regimes are moderate overload progression and longer intervals re-perform to long term adaptation (Hill-Haas et al., 2006). Accordingly, maximum number of repetition both short and long rest intervals related to endurance zone working principle, however, not determined on rest interval (Willardson et al., 2006). Primarily zone strategies may be short rest (<1 min) constant set to high volume, however, long interval (>2 min) increased high strength and endurance performance level (Schoenfeld et al., 2016; Aycan et al., 2023). Other studies used to load range <90 of 1RM overload principle on multiple sets noted per set evaluated on 3 and 5 min rest interval to short time periodization (Mangine et al., 2015; Grgic et al., 2018; Aycan et al., 2023). Contrast, 85% of 1RM repeated constant sets yield strength, hypertrophic and endurance effect contributed by short and long rest intervals (Aycan et al., 2023; Krzysztofik et al., 2019). In this study, resistance training regimes used on deload repetition by manipulated rest interval and multiple sets not performed on currently strength training strategic light weeks and recovery weeks methodology. Thus this study performed on longer rest interval to maximum strength gains to promote strength performance level in light weeks of weightlifters.

CONCLUSION

This study was performed to weightlifters for the first time on the principle of general resistance training. In the research, weightlifting exercises that determine the performance level of weightlifting were included in maximum load lifting tasks. For the purpose of this study, long rest intervals and deload repetition method in multiple sets and zone displacement in continuum zone repetition were applied. As a result, the deload repetition method can be used to monitor changes in the performance levels of weightlifters in order to general strength gains in short time weightlifting training and to ensure strength transitions during load changes.

AUTHOR CONTRIBUTIONS

Yeliz Kahraman was designed study. İsmail Varol was applied study. Atilla Şahan was formed statistical design. Aykut Hocalar was formed study investigate.

SUPPORTING AGENCIES

No funding agencies were reported by the authors.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

REFERENCES

American College of Sports Medicine (2009). American College of Sports Medicine position stand. Progression models in resistance training for healthy adults. Medicine and science in sports and exercise, 41(3), 687-708. https://doi.org/10.1249/MSS.0b013e3181915670

Burcu, A., Tahir, K., & Yeliz , K. (2023). Multi joint short term resistance training strength zone evaluated on maximal strength, maximal ısometric strength, peak isom reach, maximal isometric endurance and muscular local endurance in resistance trained men. Revista De Gestão E Secretariado, 14(10), 18789-18801. https://doi.org/10.7769/gesec.v14i10.3081

Campos, G. E., Luecke, T. J., Wendeln, H. K., Toma, K., Hagerman, F. C., Murray, T. F., Ragg, K. E., Ratamess, N. A., Kraemer, W. J., & Staron, R. S. (2002). Muscular adaptations in response to three different resistance-training regimens: specificity of repetition maximum training zones. European journal of applied physiology, 88(1-2), 50-60. https://doi.org/10.1007/s00421-002-0681-6

De Camargo, J. B. B., Brigatto, F. A., Zaroni, R. S., Trindade, T. B., Germano, M. D., Junior, A. C. T., DE Oliveira, T. P., Marchetti, P. H., Prestes, J., & Lopes, C. R. (2022). Manipulating Resistance Training Variables to Induce Muscle Strength and Hypertrophy: A Brief Narrative Review. International journal of exercise science, 15(4), 910-933.

de Salles, B. F., Simão, R., Miranda, F., Novaes, J.daS., Lemos, A., & Willardson, J. M. (2009). Rest interval between sets in strength training. Sports medicine (Auckland, N.Z.), 39(9), 765-777. https://doi.org/10.2165/11315230-000000000-00000

Grgic, J., Schoenfeld, B. J., Skrepnik, M., Davies, T. B., & Mikulic, P. (2018). Effects of Rest Interval Duration in Resistance Training on Measures of Muscular Strength: A Systematic Review. Sports medicine (Auckland, N.Z.), 48(1), 137-151. https://doi.org/10.1007/s40279-017-0788-x

Hill-Haas, S., Bishop, D., Dawson, B., Goodman, C., & Edge, J. (2007). Effects of rest interval during high-repetition resistance training on strength, aerobic fitness, and repeated-sprint ability. Journal of sports sciences, 25(6), 619-628. https://doi.org/10.1080/02640410600874849

Kraemer, W. J., & Ratamess, N. A. (2004). Fundamentals of resistance training: progression and exercise prescription. Medicine and science in sports and exercise, 36(4), 674-688. https://doi.org/10.1249/01.MSS.0000121945.36635.61

Krzysztofik, M., Wilk, M., Wojdała, G., & Gołaś, A. (2019). Maximizing Muscle Hypertrophy: A Systematic Review of Advanced Resistance Training Techniques and Methods. International journal of environmental research and public health, 16(24), 4897. https://doi.org/10.3390/ijerph16244897

Mangine, G. T., Hoffman, J. R., Gonzalez, A. M., Townsend, J. R., Wells, A. J., Jajtner, A. R., Beyer, K. S., Boone, C. H., Miramonti, A. A., Wang, R., LaMonica, M. B., Fukuda, D. H., Ratamess, N. A., & Stout, J. R. (2015). The effect of training volume and intensity on improvements in muscular strength and size in resistance-trained men. Physiological reports, 3(8), e12472. https://doi.org/10.14814/phy2.12472

Shetty, A. B. (1990). Quantification of Selected Segmental Strengths In Weightlifting. Journal of Strength and Conditioning Research. 4(2): 37-41. https://doi.org/10.1519/00124278-199005000-00002

Schoenfeld, B. J., Pope, Z. K., Benik, F. M., Hester, G. M., Sellers, J., Nooner, J. L., Schnaiter, J. A., Bond-Williams, K. E., Carter, A. S., Ross, C. L., Just, B. L., Henselmans, M., & Krieger, J. W. (2016). Longer Interset Rest Periods Enhance Muscle Strength and Hypertrophy in Resistance-Trained Men. Journal of strength and conditioning research, 30(7), 1805-1812. https://doi.org/10.1519/JSC.0000000000001272

Schoenfeld, B. J., Grgic, J., Van Every, D. W., & Plotkin, D. L. (2021). Loading Recommendations for Muscle Strength, Hypertrophy, and Local Endurance: A Re-Examination of the Repetition Continuum. Sports (Basel, Switzerland), 9(2), 32. https://doi.org/10.3390/sports9020032

Soriano, M. A., García-Ramos, A., Torres-González, A., Castillo-Palencia, J., Marín, P. J., de Baranda, P. S., & Comfort, P. (2020). Comparison of 1-Repetition-Maximum Performance Across 3 Weightlifting Overhead Pressing Exercises and Sport Groups. International journal of sports physiology and performance, 15(6), 862-867. https://doi.org/10.1123/ijspp.2019-0582

Willardson, J. M., & Burkett, L. N. (2006). The effect of rest interval length on the sustainability of squat and bench press repetitions. Journal of strength and conditioning research, 20(2), 400-403. https://doi.org/10.1519/R-16314.1. https://doi.org/10.1519/R-16314.1