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Faculty of Physical Education, University of Sadat City
Journal of Theories and Applications of physical education sport sciences

Original Article

Title:

Effectiveness of Specific Stabilization Exercise on Strength, Balance for Beginner Weightlifters

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Doi : 10.21608/JAT.2023.281187

Abstract

The purpose of this study is to assess the effectiveness of using Specific Stabilizing Exercises on Strength and balance for beginner weightlifter. Balance is generally defined as the ability to maintain the body's centre of gravity within its base of support and may be categorized by either static or dynamic balance. Six novice weightlifters participated in the study. Mediolateral Maximum Strength and Explosive Power and Balance testing were performed a week before (Pre) and after (Intermediate) a 4-week and after (Post) a 8-week Specific Stabilizing Exercises program. Analysis of the results showed using Specific Stabilizing Exercises improvement dynamic balance and digital level for beginner weightlifter. where the value of (f) between (19.30 to 117.05) in dynamic balance test. The results also showed statistically significant differences in favor of the maximum strength test where the value of (54.36), while the explosive power did not show any statistically significant differences. All of these improvements lead to an improved digital level for beginners' weightlifters Where the value of (f) the two Lifts snatch and clean and jerk. (18.17) - (22.09). Such an exercise program can be incorporated into a training regime of Beginner weightlifters to improve core stability as well as dynamic balance and then their digital level.

Keywords :

Specific Stabilizing Exercises, Dynamic balance, Core stability.

Introduction

Weightlifting is considered one of the Olympic sports that contribute to achieving an overall balance of the individual practitioner. In addition to the improvement in the level of multiple

muscle strength types. the Olympic lifts are very complex and contain a high degree of technical difficulty .These exercises require also greater core stability and overall dynamic body balance Many elite athletes continue to undertake core stability and core strength training as part of their training programme.(36),(11)

For weightlifters, the enhancement of strength and balance plays a critical role in their performance, since they must control extremely heavy weights above their head height for a couple of seconds, while their arms are fully extended. Any kind of muscle imbalance and inappropriate technique may hamper athletes' performance and lead to dangerous situation. (32

Olympic-style weightlifting are slightly different from other sports because weightlifters often consciously focus on bracing or stabilizing prior to initiating movement. Whereas in other sports, like tennis, basketball, or marathon running, stabilization is a complex process running in the background as the athlete focuses on external tasks. In each of these cases, the brain must continuously work to regulate intra- abdominal pressure (IAP) to preserve spinal stability for movement and function.(13)

Core muscles consist of the rectus abdominis, transverse abdominis, multifidus (back muscles), internal and external obliques, quadratus lumborum (low-back muscle), and spinal erectors (back muscles). To a greater extent, the glutes, hamstrings, and hip rotators may also be included because of their relationship to the hip joint.(27),(30)

The primary function of the core is for stabilization. Stability is the ability to control force or movement. Core stabilization is important because it provides a powerful link between lower and upper body strength. Generally, core development will consist of flexion-extension type exercises (sit-ups) that target the rectus abdominis. However, although the core is being strengthened, these exercises do not address the need for a stable spine or the transfer of power from the lower to upper body. Also, because of the body's position (lying) in most of these exercises, there is a low carryover to actual sport. The best core work is done in a sport-specific stance (standing), while maintaining the spine in an upright and erect position and allowing movement from the extremities in practical ways that place stress on the core (squat).(19),(20),(28)

Posture will be much more challenged during two lifts positions (clean- snatch). The weight or resistance is placed above the head at arm's length, causing a shift in the body's center of gravity. Remember, the center of gravity or point of stability resides in the core. If the core is off balance, the body is off balance. Because of this increased distance, the center of gravity shifts higher, thus requiring the muscles of the core to work harder in order to stabilize and support the spine in an upright position. Overhead squatting also puts the trunk in an elongated position, which in turn causes a natural activation of the core muscles. With the arms fully extended overhead, the deep abdominal muscles (transverse abdominals, internal/external obliques) along with the spinal erectors, must contract in order for both stabilization and thoracic extension to be maintained.(17)

Dynamic balance is one of the most important motor skills and is defined as the ability to perform a task while maintaining or regaining a stable position, or the ability to maintain or regain balance on an unstable surface with minimal extraneous motion. Improving the dynamic balance can improve the overall physical performance in most sports, such as judo, gymnastics, weightlifting. (27),(26),(16)

In addition, exercise performed on unstable sur- faces rather than under stable conditions seems to more effectively increase muscle activation patterns in the trunk region and limbs, while decreasing perceived exertion. The overall effects of this approach, which is termed “core stability and strength enhancement”, may possibly improve athletic performance and reduce the incidence of injury. As a result, it has a growing popularity not only among elite athletes but also the general population. (2),(7),(25),(24)

There is a lack of research looking at the effect of core stability on athletic performance. Although some studies have implied that there is an advantageous effect on performance by improving core stability and strength, these conclusions are largely assumptions based on basic testing. reported that core stability and balance are critical for good performance in almost all sports and activities. This is due to the 3-dimensional nature of many sporting movements, which demands that athletes must have good strength in the hip and trunk muscles to provide effective core stability. Some sports require good balance, some force production, and others body symmetry, but all require good core stability in all three planes of motion lack of core strength and stability is thought to result in an inefficient technique, which predisposes the athlete to injury.

The most predominant literature regarding balance has emphasized the physio- logical mechanisms controlling stability. Topics range from extrinsic factors (environment) to intrinsic factors (muscle coordination, vestibular response). Balance is achieved through an interaction of central anticipatory and reflexive actions as well as the active and passive restraints imposed by the muscular system. However, less research has attempted to document the effects of balance on performance measures (force, power). Furthermore, short- and long-term adaptations to unstable environments need more substantial research. While force and other performance measures can be adversely affected by a lack of balance, the transferability of instability training to activities of sport is not precisely known. The applicability of instability and resistance training using unstable platforms or implements may have strong relevance in athletic setting. Therefore, a comprehensive review of the literature in this area may possibly be of benefit to practitioners who deal with the athletes or persons debilitated by balance and/or stability disabilities. (3)

Over the past two decades, coaching professionals and athletes have shown increasing interest in training routines to enhance the physical prerequisites for strength performance in this regard. Exercise scientists have identified instability resistance training as a possible means to improve strength performance under conditions of instability with a special emphasis on the core muscles.(5)

Research objective:

- Identify effective of using Specific Stabilizing Exercises on strength, dynamic balance for beginner weightlifter.

Research hypothesis:

- Are there any statistically significant differences between pre and post measurement to experimental group, which implements the program of Specific Stabilizing Exercises on Maximum strength and Explosive power.
- Are there any statistically significant differences between pre and post measurement to experimental group, which implements the program of Specific Stabilizing Exercises on dynamic balance.
- Are there any statistically significant differences between pre and post measurement to experimental group, which implements the program of Specific Stabilizing Exercises on Digital level.

Material and Methods

Research procedures:

The researchers used the experimental approach using the experimental design of a single experimental set in a method (Intermediate measurements).

Research domains:

Spatial domain:

All pre, in-between and post measurements, and Implementing training program were conducted at in the weightlifting hall, the gymnasium, of physical Education at the University of Alexandria

Time domain:

- Premeasurements conducted in the period from April 10th to April 15th, 2021
- Program implementation conducted in the period from April 17th to June 15th, 2021.
- Post measurements conducted in the period from June 16th to June 20th, 2021.

Research sample:

- The sample was randomly selected from beginner weightlifters, **with a total 6 players.**

Measuring devices:

- **Basic measurements:** - **Age (Age) / total length of the body / the body weight**
- **Physical measurements:** - Sargent Test (cm) / Front squat test (kg)
- **Special measurements:** - Y Balance Test (cm) / ON leg Squat (Rep)
- **Record Level :** - Record Level to snatch / Record level to clean and jerk.

Program design

Training program, which consisted of 8 weeks with 4 training units per week, program with a combination of specific stability exercises, strength exercise, weightlifting exercises. The

balance training interventions consisted of balance exercises on both a stable and unstable surface, with or without recurrent destabilization during performance. such as Overhead Pitcher's Squat on Ball - Overhead Lunge.

Equipment and exercises:

Training program included exercises on stable and unstable surfaces in anterior/posterior and mediolateral directions, with or without recurrent destabilization (strengthening exercises , the balance training programs included transitions from a double-leg stance to a single-leg stance on a stable or unstable surface For these types of exercises. wobble boards that allow for multiplanar movement, BOSUs inflated rubber discs and Swiss balls. These activities were also combined with resistance exercises while balancing with Hanging Band. Core stability training was also used to improve balance. Core stability exercises were also performed using Swiss balls.

Program Components :

Table 2.
Procedure of the 10-week specific stabilization exercise program

1	**Stability Snatch Exercises**	**4**	**Stability Clean Exercises**
1.	Snatch Start position On unstable surface	1.	Clean Start position on unstable surface
2.	Single-Arm Dumbbell Snatch	3.	Single-Arm Dumbbell clean
3.	Single Leg Snatch	4.	Single Leg clean
4.	Dumbbell Hang Power Snatch	5.	Dumbbell Hang Power clean
5.	Single-leg dumb-bell snatch	6.	Single-leg dumb-bell clean
6.	Kettlebell One Arm Split Snatch	7.	Kettlebell One Arm Split clean
2	**Stability Overhead Squat Exercises**	**5**	**Stability Squats Exercises**
1.	Hanging band Overhead Squats	1.	Single Leg Squat
2.	Single-Arm Dumbbell Overhead Press	2.	F.S different weight on both sides
3.	Overhead Bulgarian split squat on ball	3.	Parallel squat on unstable surface
		4.	Hanging Band Squats
3	**Weight Stability Exercises**	**6**	**Stability Core Exercises**
1.	Single Leg Bent Over Barbell Row	1.	Russian twist on ball Twist on ball
2.	Single Leg RDL	2.	Stability ball hamstring curl
3.	Snatch Grip Romanian Deadlift one leg	3.	Single-leg stability ball hip thrust
4.	DB Lunge jump	4.	Stability ball V-pass
5.	Hanging Band RDL	5.	Stability ball deadbug
6.	Single Leg deadlift	6.	Skier crunch on ball
7.	Hanging Band Bench Press	7.	Bridge with heel raise on roller
8.	DB single arm chest press on ball	8.	Stability Ball Knee Tucks

Procedural research steps :

1. Designing and codifying appropriate tests for measuring and analyzing research variables.
2. Designing a training program on a scientific basis for the experimental research group that

includes specific stabilization exercises.

3. Conducting Pre-measurements for the research sample
4. Implementation of the trial program
5. Conducting the Intermediate measurements during the experiment.
6. Conducting Post measurements of the research variables.
7. Processing data statistically and describing it in tables for discussing the results.

Statistical methods:

All statistical work has been done using SPSS program to find out the following:

- Minimum
- Maximum
- arithmetic mean.
- standard deviation.
- Skewness, variance, and kurtosis coefficient.
- Improvement Percentile
- Repeated Measures ANOVA
- Eta square coefficient
- Lowest significant difference L.S.D

Results

Table (1)
Descriptive Statistics

N=6

Statistical indications / Variables			Unit	Minimum	Maximum	Mean	Std.	Skewness	Kurtosis
Basic variables	Age		year	20.00	24.00	22.67	1.37	-1.93	4.55
	Height		cm	168.00	180.00	175.50	4.09	-1.38	2.82
	Body Weight		kg	62.00	91.00	75.50	9.89	0.45	0.54
Physical variables	Maximum Strength	Front Squat	kg	90.00	120.00	96.67	11.69	2.22	5.08
	Explosive Power	Sargent Test	cm	260.00	293.50	272.75	11.54	1.25	2.26
	Y Balance Test	Left Posterolateral	cm	68.00	80.00	72.17	4.92	0.91	-0.64
		Right Posterolateral	cm	61.00	86.00	66.83	9.79	2.06	4.32
		Left Posteromedial	cm	55.00	89.00	74.83	11.82	-0.83	0.88
		Right Posteromedial	cm	67.00	90.00	76.92	8.36	0.51	-0.27
		Left Anterior	cm	40.00	56.00	47.50	5.39	0.30	0.81
		Right Anterior	cm	46.00	59.00	51.50	4.23	1.00	2.67

Statistical indications / Variables				Unit	Minimum	Maximum	Mean	Std.	Skewness	Kurtosis
	Dynamic Balance	ON leg Squat	Left	rep	3.00	13.00	7.33	3.93	0.37	-1.58
			Right	rep	3.00	10.00	5.33	2.50	1.61	2.85
record level			Clean and Jerk	kg	55.00	100.00	67.50	16.66	2.02	4.20
			Snatch	kg	40.00	80.00	52.83	14.70	1.49	2.72

Table (1) results reveal of the statistical significance of the research sample in the basic variables, physical tests, and digital level under study before the experiment that the data for the total research sample are moderate, not scattered and characterized by the normal distribution of the sample, where the values of the torsion coefficient range between (-1.93 to 2.22). These values are close to zero, which confirms the moderation of the data for the research sample before the experiment.

Table (2)

Statistical indications of physical variables and the dynamic balance and digital Level of the experimental group before, during and after the experiment

N=6

Statistical indications / Variables			Unit	Tribal measurement		Inter measure		Distance measurement		F
				Mean	Std.	Mean	Std.	Mean	Std.	
Maximum Strength	Front Squat		kg	96.67	11.69	109.17	15.63	118.33	13.66	*54.36
Explosive Power	Sargent Test		cm	272.75	11.54	275.83	10.83	277.08	7.61	3.50
Y Balance Test	Left Posterolateral		cm	72.17	4.92	85.33	8.59	90.33	5.99	*25.02
	Right Posterolateral		cm	66.83	9.79	92.00	7.67	97.17	6.18	*117.05
	Left Posteromedial		cm	74.83	11.82	90.00	6.03	94.33	7.09	*19.30
	Right Posteromedial		cm	76.92	8.36	90.50	7.66	95.00	7.07	*43.13
	Left Anterior		cm	47.50	5.39	53.17	2.79	56.83	4.12	*31.09
	Right Anterior		cm	51.50	4.23	55.17	3.87	58.00	3.16	*22.32
Dynamic Balance	ON leg Squat	Left	rep	7.33	3.93	9.50	5.32	18.00	6.81	*17.68
		Right	rep	5.33	2.50	10.50	2.74	16.83	8.04	*12.77
Digital level	Clean and Jerk		kg	67.50	16.66	75.00	18.44	80.33	20.85	*18.17
	Snatch		kg	52.83	14.70	56.92	18.34	63.67	18.83	*22.09

Significant at the level (0.05) the tabular value of "F" (5.05) *

Table (2) results reveal of the statistical significance of the physical variables (maximum strength - explosive power) that there are statistically significant differences at the 0.05 level) between the pre-measurement, inter-measurement, and post-measurement in the variable of maximum strength, while there are no Statistically significant differences in the explosive power variable.

Table (2) results reveal of the statistical significance of the variables related to the dynamic balance (Y Balance Test- ON leg Squat) that there are statistically significant differences at the level of 0.05) between the pre-measurement, the inter-measurement, and the post-measurement, where the ranged The calculated (F) values are between (12.77: 117.05), and these values are greater than the tabular " F " value at the (0.05) level.

Table (2) results reveal of the statistical significance of the variables related to the numerical level (Clean and Jerk - Snatch) that there are statistically significant differences at the 0.05 level) between the pre-measurement, the inter-measurement, and the post-measurement, where the values of (F) calculated between (18.17: 22.09), and these values are greater than the tabular value of " F " at the level (0.05).

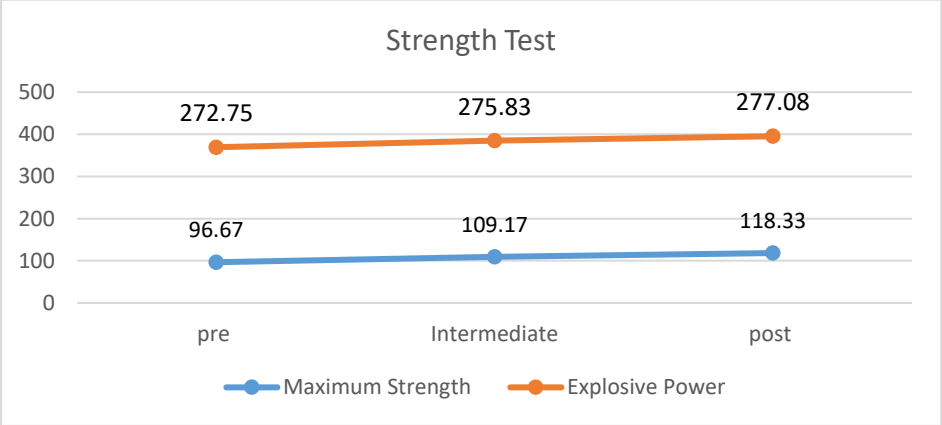

Figure (1) The arithmetic mean of the (maximum Strength – explosive power) for the experimental group before, during and after the experiment

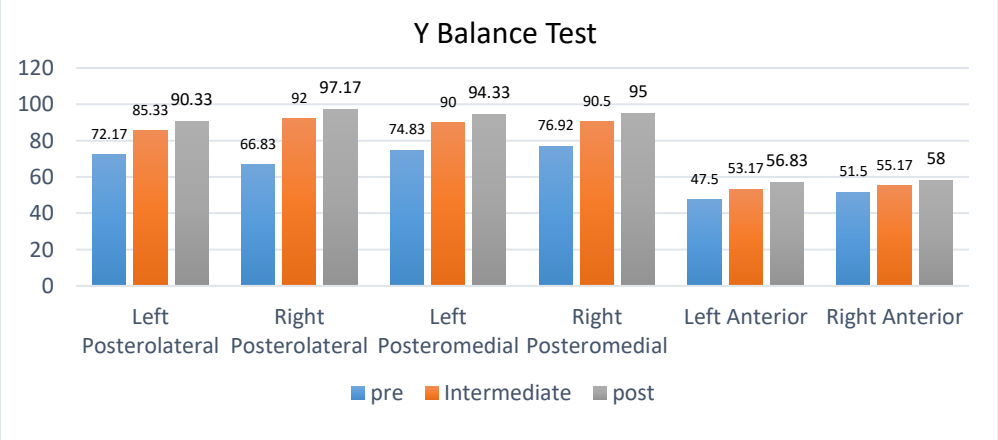

Figure (2) The arithmetic mean of the dynamic balance tests (Y balance test) of the experimental group before, during and after the experiment

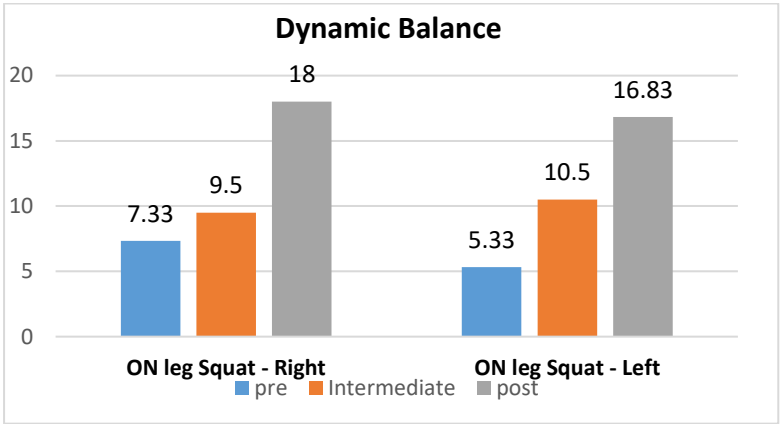

Figure (3) Arithmetic mean of the dynamic balance test (On leg squat) of the experimental group before, during and after the experiment

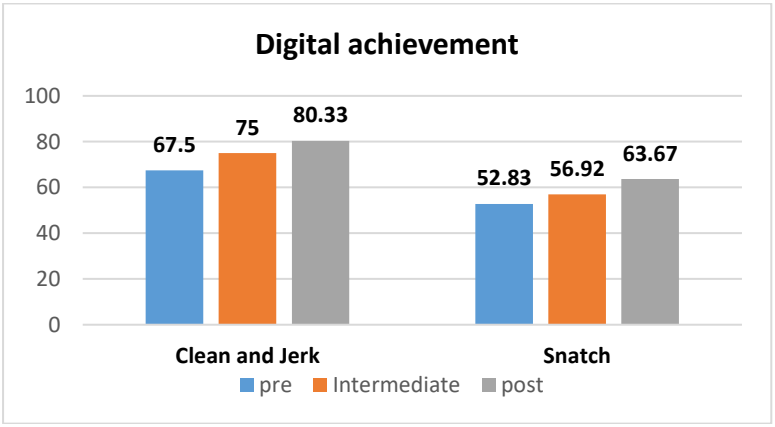

Figure (4) The arithmetic means of the Digital level (Clean and jerk-Snatch) of the experimental group before, during and after the experiment

Table (3)

Contrast analysis of repeated measurements **(tribal- inter-dimensional)** of physical variables, dynamic balance and Digital level of the experimental group

Statistical indications / Variables			Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Maximum Strength	Front Squat	Intercept	210168.06	1	210168.06	*388.20	0.00	0.99
		Error	2706.94	5	541.39			
		Sphericity Assumed	1419.44	2	709.72	*54.36	0.00	0.92
		Sphericity Assumed Error	130.56	10	13.06			
Explosive Power	Sargent Test	Intercept	1363450.89	1	1363450.89	*4680.22	0.00	1.00
		Error	1456.61	5	291.32			
		Sphericity Assumed	59.69	2	29.85	3.50	0.07	0.41
		Sphericity Assumed Error	85.31	10	8.53			
Y Balan		Intercept	122842.72	1	122842.72	*1340.26	0.00	1.00
		Error	458.28	5	91.66			

Statistical indications / Variables			Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
	Left Posterolateral	Sphericity Assumed	1056.78	2	528.39	*25.02	0.00	0.83
		Sphericity Assumed Error	211.22	10	21.12			
	Right Posterolateral	Intercept	131072.00	1	131072.00	*790.86	0.00	0.99
		Error	828.67	5	165.73			
		Sphericity Assumed	3160.33	2	1580.17	*117.05	0.00	0.96
		Sphericity Assumed Error	135.00	10	13.50			
	Left Posteromedial	Intercept	134334.72	1	134334.72	*833.05	0.00	0.99
		Error	806.28	5	161.26			
		Sphericity Assumed	1258.11	2	629.06	*19.30	0.00	0.79
		Sphericity Assumed Error	325.89	10	32.59			
	Right Posteromedial	Intercept	137725.01	1	137725.01	*895.01	0.00	0.99
		Error	769.40	5	153.88			
		Sphericity Assumed	1063.53	2	531.76	*43.13	0.00	0.90
		Sphericity Assumed Error	123.31	10	12.33			
	Left Anterior	Intercept	49612.50	1	49612.50	*1095.20	0.00	1.00
		Error	226.50	5	45.30			
		Sphericity Assumed	265.33	2	132.67	*31.09	0.00	0.86
		Sphericity Assumed Error	42.67	10	4.27			
	Right Anterior	Intercept	54230.22	1	54230.22	*1459.55	0.00	1.00
		Error	185.78	5	37.16			
		Sphericity Assumed	127.44	2	63.72	*22.32	0.00	0.82
		Sphericity Assumed Error	28.56	10	2.86			
Dynamic Balance	ON leg Squat (Left)	Intercept	2426.72	1	2426.72	*35.38	0.00	0.88
		Error	342.94	5	68.59			
		Sphericity Assumed	381.44	2	190.72	*17.68	0.00	0.78
		Sphericity Assumed Error	107.89	10	10.79			
	ON leg Squat (Right)	Intercept	2134.22	1	2134.22	*45.26	0.00	0.90
		Error	235.78	5	47.16			
		Sphericity Assumed	398.11	2	199.06	*12.77	0.00	0.72
		Sphericity Assumed Error	155.89	10	15.59			
Digital level	Clean and Jerk	Intercept	99309.39	1	99309.39	*96.91	0.00	0.95
		Error	5123.61	5	1024.72			
		Sphericity Assumed	498.78	2	249.39	*18.17	0.00	0.78
		Sphericity Assumed Error	137.22	10	13.72			
	Snatch	Intercept	60146.68	1	60146.68	*67.50	0.00	0.93
		Error	4455.07	5	891.01			
		Sphericity Assumed	359.19	2	179.60	*22.09	0.00	0.82
		Sphericity Assumed Error	81.31	10	8.13			

Table (4) f-value at the level of 0.05 (10.97) and within the measurements (5.05)

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Table (5)

Lower moral difference (LSD) value at 0.05 between average physical variables, dynamic balance and the Digital level of the experimental group before, during and after the experiment

Statistical indication / Variables		Unit	Measurements	Mean	Mean Difference (I-J)			
					Intermeasure		Distance measurement	
Maximum Strength	Front Squat	kg	Tribal measurement	96.67	↑*12.500	0.004	*21.667↑	0.000
			Intermeasure	109.17			*9.167↑	0.002
			Distance measurement	118.33				
Explosive Power	Sargent Test	cm	Tribal measurement	272.75	3.083	0.081	4.333	0.079
			Intermeasure	275.83			1.250	0.478
			Distance measurement	277.08				
Y Balance Test	Left Posterolateral	cm	Tribal measurement	72.17	↑*13.167	0.008	*18.167↑	0.000
			Intermeasure	85.33			5.000	0.111
			Distance measurement	90.33				
	Right Posterolateral	cm	Tribal measurement	66.83	↑*21.167	0.000	↑*30.333	0.000
			Intermeasure	92.00			↑*5.167	0.002
			Distance measurement	97.17				
	Left Posteromedial	cm	Tribal measurement	74.83	↑*15.167	0.012	↑*19.500	0.005
			Intermeasure	90.00			↑*4.333	0.006
			Distance measurement	94.33				
	Right Posteromedial	cm	Tribal measurement	76.92	↑*13.583	0.003	↑*18.083	0.000
			Intermeasure	90.50			↑*4.500	0.023
			Distance measurement	95.00				
	Left Anterior	cm	Tribal measurement	47.50	↑*5.667	0.016	↑*9.333	0.000
			Intermeasure	53.17			↑*3.667	0.003
			Distance measurement	56.83				
	Right Anterior	cm	Tribal measurement	51.50	↑*3.667	0.018	↑*6.500	0.003
			Intermeasure	55.17			↑*2.833	0.002
			Distance measurement	58.00				
Dynamic Balance	ON leg Squat (Left)	rep	Tribal measurement	7.33	2.167	0.189	↑*10.667	0.008
			Intermeasure	9.50			↑*8.500	0.003
			Distance measurement	18.00				
	ON leg Squat (Right)	rep	Tribal measurement	5.33	↑*5.167	0.003	↑*11.500	0.006
			Intermeasure	10.50			6.333	0.083
			Distance measurement	16.83				
Digital achievement	Clean and Jerk	kg	Tribal measurement	67.50	↑*7.500	0.017	↑*12.833	0.006
			Intermeasure	75.00			↑*5.333	0.004
			Distance measurement	80.33				
	Snatch	kg	Tribal measurement	52.83	4.083	0.063	↑*10.833	0.003
			Intermeasure	56.92			↑*6.750	0.002
			Distance measurement	63.67				

Significant at a level of significance less than 0.05*

Table (6)

Improvement rates between average physical variables and the digital achievement of the experimental group before, during and after the trial

Statistical indications / Variables		Unit	Measurements	mean	Improvement rates	
					Intermeasure	Distance measurement
Maximum Strength	Front Squat	kg	Tribal measurement	96.67	%12.93	%22.40
			Intermeasure	109.17		%8.39
			Distance measurement	118.33		
Explosive Power	Sargent Test	cm	Tribal measurement	272.75	%1.13	%1.59
			Intermeasure	275.83		%0.45
			Distance measurement	277.08		
Y Balance Test	Left Posterolateral	cm	Tribal measurement	72.17	%18.23	%25.16
			Intermeasure	85.33		%8.57
			Distance measurement	90.33		
	Right Posterolateral	cm	Tribal measurement	66.83	%37.66	%45.39
			Intermeasure	92.00		%5.62
			Distance measurement	97.17		
	Left Posteromedial	cm	Tribal measurement	74.83	%20.27	%26.06
			Intermeasure	90.00		%4.81
			Distance measurement	94.33		
	Right Posteromedial	cm	Tribal measurement	76.92	%17.65	%23.50
			Intermeasure	90.50		%4.97
			Distance measurement	95.00		
	Left Anterior	cm	Tribal measurement	47.50	%11.94	%19.64
			Intermeasure	53.17		%6.88
			Distance measurement	56.83		
	Right Anterior	cm	Tribal measurement	51.50	%7.13	%12.62
			Intermeasure	55.17		%5.13
			Distance measurement	58.00		
Dynamic Balance	ON leg Squat (Left)	number	Tribal measurement	7.33	%29.60	%145.57
			Intermeasure	9.50		%89.47
			Distance measurement	18.00		
	ON leg Squat (Right)	number	Tribal measurement	5.33	%96.99	%215.75
			Intermeasure	10.50		%60.29
			Distance measurement	16.83		
Digital achievement	Clean and Jerk	kg	Tribal measurement	67.50	%11.11	%19.00
			Intermeasure	75.00		%7.11
			Distance measurement	80.33		
	Snatch	kg	Tribal measurement	52.83	%7.74	%20.52
			Intermeasure	56.92		%11.86
			Distance measurement	63.67		

Discussion

The primary objective of our study was to investigate the effects of Specific Stabilizing Exercises on Strength and balance for Beginner weightlifters preparing for Olympic lifts. The main findings are that the applied training program, which consisted of 8 weeks with 4 training units per week, significantly improved the maximum strength, dynamic balance and digital level for Beginner weightlifters.

Strength

The results of Strength showed a significant improvement in the maximum strength, which reached the value of F (54.36) while there were no significant differences in the explosive power test. These results are in agreement with studies Behm DG, 2002. Zemkova ,2017.

The researcher explains the improvement in maximum strength due to the effect of instability exercises on the core muscles, which have a key role in lifting maximum weights because of their importance in the stability of the spine and maintaining the position of the trunk erect. Strong correlation with the performance in weightlifters.

The results of strength in training program may be affected by some considerations, including weightlifted, subject's training back- ground, number of repetitions and sets, rest intervals, and so forth. This fact has to be taken into account when instability resistance exercises are implemented into the training program. These results are in agreement with studies Erika Zemkova, 2017 .

Balance

The results of the dynamic balance showed a significant improvement in the balance for the quads resulting from the development of the Core muscle, and the results of the dynamic balance tests led to that. Where the F value of the (Y Balance Test- ON leg Squat) tests ranged between (12.77: 117.05). These results are in agreement with studies Imai, A., Kaneoka et al 2014. Hassan I, (2017). Watson, T,et al 2017. Rafał Szafraniec1, 2020. Szafraniec R, 2018. Stanton R, 2004 .

A more pronounced activation of stabilizing muscles is assumed to be the main feature of instability resistance exercises. This assumption has been proven by EMG studies, which have highlighted significantly greater electromyographic activity of trunk-stabilizing muscles during exercises under unstable as compared to stable conditions. Intervention studies also demonstrated an enhanced improvement of trunk stability after training programs utilizing unstable devices as compared to floor exercises. Findings indicate that instability resistance training may facilitate the neural adaptation of trunk-stabilizing muscles, resulting in an improvement in trunk stability. Erika Zemkova, 2017 . Hassan I, 2017. Ozmen T, 2016. Sandrey M.A,2013.

The analyses including papers in which training protocols demonstrated positive effects on balance performance suggest that an efficient training protocol should last for 8 weeks, with a frequency of two training sessions per week, and a single training session of 45 min. This standard was established based on 36 reviewed studies. Anna Brachman et al ,2017. Bryanton ,2017.

Training under unstable and imbalanced conditions results in stability and that can be experienced during a variety of daily and sport activities. However, it is reasonable to assume that using unstable surfaces during training should be based on improvement of the neuromuscular adaptation process, particularly at the early stages of a resistance training pro- gram. In addition, it is a favorable to admit that enhancing balance ability produces greater muscular functionality. Sung Hwan et al 2013. Behm DG,2006. Behm DG,1995. Kibele A, 2009.

Record level

- The results of the digital level showed a significant improvement the variables related to the numerical level (Clean and Jerk - Snatch) which reached the value of F (18.17: 22.09), and these values are greater than the tabular value of "F " at the level (0.05).
- This study focused more on muscular balance, strength, and strength development, and these three factors are leading to an improvement in the Digital level for weightlifters.
- Performance improves better if the training is specific to the type of activity practiced and includes the most important muscles working in this activity.
- The development in digital achievement occurs when completing the physical attributes of the lifter, because weightlifting is one of the sports that require high physical fitness, and lifters need a set of physical attributes, the most important of which are: maximum muscular strength, ability and balance, and there is also a positive correlation between strength and the digital level of the lifters. Vorobyev A.N ,1978.

Conclusion(s)

The applied short-term of Specific Stabilizing Exercises for weightlifting improved Strength, dynamic balance and Core muscle in Beginner weightlifters attempting to start training the Olympic lifts. Such a training program can be incorporated into a training regime of Beginner weightlifters to prepare them for technically difficult exercises using free weights.

Greater instability should challenge the neuromuscular system to a greater extent than stable conditions, possibly enhancing strength gains attributed to neural adaptations. Hence instability resistance training programs may both improve athletic performance.

Recommendations:

1. The core muscles are one of the most important muscles that maintain the balance of the lifters, and therefore attention must be paid to their development.
2. Use the suggested Specific Stabilizing Exercises in the program to develop balance for Beginner weightlifters.
3. It is important to pay attention to the development of dynamic balance for beginner lifters because of its impact on the development of performance.
4. The exercises included in the lifters training programs must be varied between balance exercises - strength - explosive power because they are the basic elements for the development of the level.

5. Diversity in the use of tools in the exercise adds an atmosphere of joy and enjoyment of the exercise.

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