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Effect of assistance exercises for the snatch on barbell speed and performance for weightlifters

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Abstract. This study aims to identify Effect of assistance exercises for the snatch on barbell speed and performance for Weightlifters. Applied study on a sample of 14 lifters from the Youth weightlifters team in Beni Suef cities/Egypt of the season 2014/2015, the researcher used experimental method to design two groups; one experimental consisted of 7 lifters and the other control group of 7 lifter. Where the average age of 18.21 ± 0.80 years, height 174.28 ± 6.03 cm, weight 74.14 ± 8.88 kg and age training 3.92 ± 0.91 month. The experimental group underwent an assistance exercises for the snatch program for barbell speed and performance in the snatch, while the control group underwent a training program with exercises classic. Assistance exercises for the snatch program Continued for 8 Weeks 5 times per week and the training session lasted 2 hours. The training program using exercise showed a statistically significant improvement for assistance exercises on barbell speed, velocity (vertical, horizontal) for snatch lift and performance weightlifters. Interest in using assistance exercises for snatch and private exercises of pull, power snatch and squat snatch has an important role in the success of the performance of the snatch. Training according to power curve, speed and time of the barbell trajectory and muscle working performance. The need for evaluation of barbell trajectory during the performance by modern techniques for analysis of kinetic activity links it with training programs for weightlifters. These results must be taken into account by the coaches and weightlifters to use the assistance exercises for snatch to improve the kinetic performance and the level of achievement lifting snatch for weightlifters.

Keywords. Barbell speed, performance, snatch, weightlifters.

Introduction

Snatch is the first lift in the weightlifting program competitions, barbell lifting from the platform to above of head in one continuous motion without stopping (Gourgoulis & Aggelousis, 2014). technical performance phase in snatch start position, first pull, double knee bend, second pull, turnover and stand and stability phase .These phases offset mechanically Lift-off, first acceleration, transition, final acceleration, Turnover and stand and stability phase

Balanced development in weightlifting must be carried out using the assistance exercise to contain the kinetic performance phases for (snatch, clean and jerk) and this exercise has to be training them where we can say it is an aim to develop the level of achievement in weightlifting (Lear, 1980).

Increase muscle strength in a certain sporting activity requires effective development training either itself or an exercise similar to him in the most important points in addition to that must lead exercise the same speed required by performing the skill (Dresckler, 1998). There several recent trends point to the importance exercises, which are similar the time path powers in active muscle groups during the exercise with time path during her snatch performance (Kristy, 1998). The importance of using assistance exercise in the training programs of weightlifting is to achieve a balanced and integrated development for weightlifters (Lear, 1980; Isaac, 2007; Nabil 2011). However, the use of assistance exercise for Snatch lift training is not just the practical side through the training unit, however, we must take into account the mechanical aspects of each exercise commensurate with trajectory of the exercise movement and the field of movement snatch.

This is light through the following: The large distance between the feet through the pull phases disperses the work of the muscles of the leg. Lifter elevates buttocks before the raising bar. Barbell move away from weightlifter body at full extension, leading to jump in front at the Turnover phase. Weak full extension occurs in case of none of extending the ankle joint or extending the shoulder joint, or both, or a lack of speed of barbell.

Through follow-up training for some lifters notice that trainers rely on exercises, classic exercises help without an association with variables dynamic performance. In addition, depend on the interest in development of muscular strength to cope with weight regardless to the winches and the forces acting on lift. Then researchers found study kinematic variables to snatch using some exercises to help, according to these variables is a means that may contribute to the performance of the lifters development by overcoming those affecting the powers weight and thus improve the performance of weightlifters. This study aims to identify effect of assistance exercises for the snatch on barbell

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speed and performance for Weightlifters. Through the achievement of the following purposes: Identify the effect of assistance exercises of snatch on barbell speed.

Material and methods

Applied study on a sample of 14 lifters from the Youth weightlifters team in Beni Suef cities / Egypt of the season 2014/2015, the researcher used experimental method to design two groups, one experimental consisted of 7 lifters and the other control group of 7 lifters. Where the average age of 18.21 ± 0.80 years, height 174.28 ± 6.03 cm, weight 74.14 ± 8.88 kg and age training 3.92 ± 0.91 month.

The experimental group underwent an assistance exercises for the snatch program for barbell speed and performance in the snatch, while the control group underwent a training program with exercises classic. Assistance exercises for the snatch program Continued for 8 Weeks 5 times per week and the training session lasted 2 hours (Appendix 1) (Lukjanow & Falamejow, 1972; Carl, 1976; Lear, 1991; Ebada, 2003; Ebada, 2013).

The pre and post photograph for the two control and experimental used a video camera Brand Sony, frequency 25 frames in the second. The analysis of motor used Win analyzes the program, measured physical tests and performance tests for the two groups. The camera is placed just 6 meters from the left side of the weightlifter and one meter high from the ground, Figure 2.

Physical tests: Through Reference survey of research on the sport of weightlifting, it was to identify the most important physical tests for snatch lift including : Power Snatch test - Pull Snatch test - Squat test - Front Squat test - Snatch numeral level (Hori et al., 2006; Hamlyn et el., 2007; Ebada, 2011; Ebada, 2013).

Kinetic analysis: The researcher using Science Laboratory of Faculty of Physical Education, Helwan University, Egypt while using Win analyzes the program, the software is designed to track and analysis of the movement Figure 1.

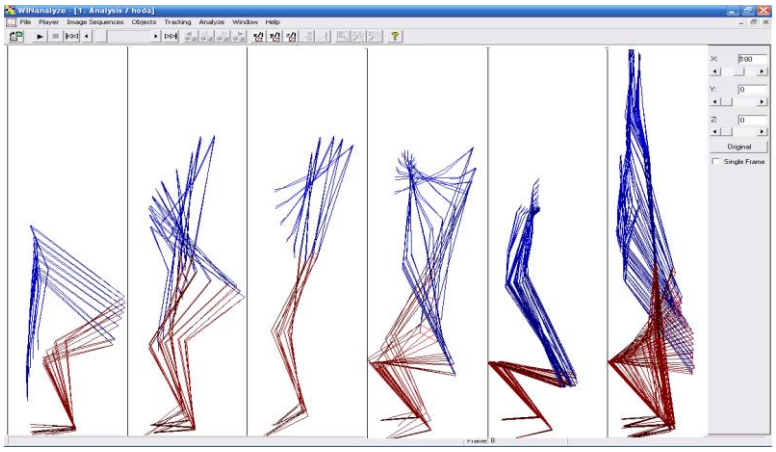

Figure 1. Kinetic analysis for snatch

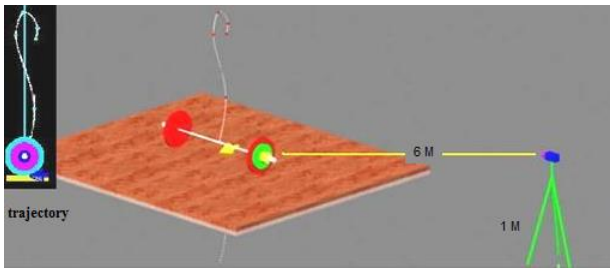

Figure 2. Camera place during the filming and Barbell trajectory.

Start position | Frist acceleration | Transition | Final acceleration | Turnover | Stand and stability | Standing up

Figure 3. The phases of the snatch.

Table 1. The significance of differences between pre and post tests of the experimental in physical variables and snatch phases in the vertical and horizontal velocity variables (n=7).

Variables		Pre test		Post test		Z	P
		Mean	SD	Mean	SD		
Physical variables	Power Snatch (kg.)	68.75	11.12	84.00	10.74	2.384	0.000**
	Pull Snatch (kg.)	97.29	10.36	124.00	15.79	2.371	0.000**
	Squat (kg.)	84.00	9.36	164.43	16.10	2.371	0.000**
	Front Squat (kg.)	77.00	10.53	146.57	18.67	2.366	0.000**
	Snatch performance (kg.)	83.14	8.35	101.86	10.88	2.366	0.000**
Vertical velocity	First acceleration (m/s)	0.78	0.02	0.93	0.01	-2.366	0.000**
	Transition (m/s) (m/s)	1.65	0.05	1.95	0.04	-2.366	0.000**
	Final acceleration(m/s)	2.02	0.06	2.31	0.04	-1.612	0.101
	Turnover(m/s)	0.55	0.02	0.67	0.01	-0.676	0.517
	Stand and stability phase (m/s)	0.50	0.03	0.53	0.02	-1.690	0.102
Horizontal velocity	First acceleration (m/s)	0.19	0.01	0.08	0.02	-1.992	0.002**
	Transition (m/s)	0.25	0.02	0.12	0.03	-2.201	0.028**
	Final acceleration (m/s)	0.25	0.01	0.15	0.00	-1.521	0.101
	Turnover (m/s)	0.06	0.00	0.7	0.01	-0.318	0.321
	Stand and stability phase (m/s)	0.11	0.01	0.10	0.00	-0.169	0.717

The Z= value ±1, 96 at the level of 0.05 (double sided)

Table 2. The Significance of Differences between Pre and Post Tests of the control group in physical variables and snatch phases in the vertical and horizontal velocity variables (n=7).

Variables		Pre test		Post test		Z	P
		Mean	SD	Mean	SD		
Physical variables	Power Snatch (kg.)	60.86	10.11	63.57	12.72	2.384	0.000**
	Pull Snatch (kg.)	89. 86	9.36	106.29	14.75	2.375	0.000**
	Squat (kg.)	119.71	8.36	183.86	15.15	2.371	0.000**
	Front Squat (kg.)	104.86	953	123	16.67	2.366	0.000**
	Snatch performance (kg.)	76.14	732	83.57	11.85	2.388	0.000**
Vertical velocity	First acceleration (m/s)	0.73	0.01	0.78	0.02	-1.185	0.225
	Transition (m/s) (m/s)	1.40	0.03	1.44	0.01	-1.183	0.225
	Final acceleration(m/s)	1.81	0.05	1.88	0.02	-0.676	0.527
	Turnover(m/s)	0.69	0.01	0.70	0.03	-0.314	0.686
	Stand and stability phase (m/s)	0.59	0.02	0.55	0.00	-1.609	0.101
Horizontal velocity	First acceleration (m/s)	0.25	0.01	0.20	0.00	-1.782	0.080
	Transition (m/s)	0.35	0.02	0.23	0.02	-1.859	0.660
	Final acceleration (m/s)	0.38	0.03	0.27	0.01	-1.472	0.138
	Turnover (m/s)	0.22	0.02	0.16	0.02	-1.014	0.287
	Stand and stability phase (m/s)	0.18	0.02	0.11	0.00	-2.023	0.000**

The Z= value ±1.96 at the level of 0.05 (double sided)

The researcher analyzed kinematic snatch of study for members of the experimental and control groups in both pre and post measurements, where 28 attempts were analyzed by using a program (Win analyzes) for kinetic parameters analysis according to the following; technical performance phase in snatch start position, first pull, double knee bend, second pull, turnover and stand and stability phase. These phases offset mechanically Lift-off, first acceleration, transition, final acceleration, turnover and stand and stability phase (Figure 3).

Analyzed are four main phases to snatch a performance (start position - Frist Acceleration - Transition - Final Acceleration – Turnover- Stand and stability- standing up) (Isaka et al., 1996; Ajan, 2006) and calculates of kinetic parameters Vertical velocity and Horizontal velocity (Newton & Kraemer, 1994; Nordin & Frank, 2001).

Statistical analyses

The statistical analysis of the control and experimental data SPSS was used to apply formulas statistical by calculating: average, standard deviation, Mann-Whitney and Wilcoxon test.

Results

Table 1 shows the results of significant statistical differences to Wilcoxon test the experimental group between pre and post measurements in tests of physical variables, Snatch performance and snatch phases in the vertical and horizontal velocity variables. Where the value of $P < 0.05$ to all variables search which shows statistically significant differences between pre and post measurement for post measurement.

Table 2 shows the results of significant statistical differences to Wilcoxon test the control group between pre and post measurements in tests of physical variables, Snatch performance and snatch phases in the vertical and horizontal velocity variables. Where the value of $P < 0.05$ to all variables search which shows statistically significant differences between pre and post measurement for post measurement.

Table 3. Statistics - test for the physical variables and snatch phases in the vertical and horizontal velocity variables of Mann -Whitney between Experimental and Control group to post-test.

Variables		Experimental group		Control group		Z	P
		Mean	SD	Mean	SD		
Physical variables	Power Snatch (kg.)	84.00	10.74	63.57	12.72	2.366	0.000**
	Pull Snatch (kg.)	124.00	15.79	106.29	14.75	2.108	0.000**
	Squat (kg.)	164.43	16.10	183.86	15.15	2.047	0.000**
	Front Squat (kg.)	146.57	18.67	123	16.67	3.148	0.000**
	Snatch performance (kg.)	101.86	10.88	83.57	11.85	2.691	0.000**
Vertical velocity	First acceleration (m/s)	0.93	0.01	0.78	0.02	-1.342	0.175
	Transition (m/s) (m/s)	1.95	0.04	1.44	0.01	-3.130	0.000**
	Final acceleration(m/s)	2.31	0.04	1.88	0.02	-3.134	0.000**
	Turnover(m/s)	0.67	0.01	0.70	0.03	-0.192	0.918
	Stand and stability phase (m/s)	0.53	0.02	0.55	0.00	-0.704	0.402
Horizontal velocity	First acceleration (m/s)	0.08	0.02	0.20	0.00	0.000	0.928
	Transition (m/s)	0.12	0.03	0.23	0.02	-2.372	0.000**
	Final acceleration (m/s)	0.15	0.00	0.27	0.01	-1.994	0.043**
	Turnover (m/s)	0.7	0.01	0.16	0.02	-1.993	0.043**
	Stand and stability phase (m/s)	0.10	0.00	0.11	0.00	-3.019	0.000**

The Z= value ±1.96 at the level of 0.05 (double sided)

Table 3 significant statistical differences of Mann-Whitney test in the post measurement of physical variables, Snatch performance and snatch phases in the vertical and horizontal velocity variables between the control and experimental groups. Where the value of P <0.05 in all research variables indicating that there are statistically significant differences between the control and the experimental group for the experimental group.

Discussion

The results showed the effectiveness of assistance exercise to snatch to increase the bar speed, as well as improve the level of achievement in the snatch of the weights and the superiority of the experimental group to the control group in physical tests and kinetic variables Vertical velocity and Horizontal velocity during performance phase of snatch in posttest (Ebada, 2008).

Optimal use of assistance exercises directly influence development of the results of weightlifter especially when using exercises (power snatch, front squat, squat, pull snatch) (Tamsh & Baroga, 2011). The increase in vertical first acceleration is phase through transition phase and final acceleration, the weightlifter benefit from this increase in speed to get to the highest point barbell in the end of final acceleration phase (Ebada, 2013).

The vertical acceleration barbell with the control weight to produce a front acceleration in the second pull creates utter importance to the completion of the motor duty and the existence of an increase in the vertical velocity of the weight continuously (Gourgoulis et al., 2000).

Assistance exercises should be similar in curve of power, speed and time of the barbell trajectory, and to be designed according to the model used in the competition movement, muscle groups working in skill, dynamic and composition during the competition (Saied, 1996).

The second pull is the fastest of all performance phases in the snatch, where increasing vertical acceleration at this phase allows for hip, knee, foot joint extension, and here it is clear influential and effective role of the second pull phase" draw (Mohammed, 1996; Nabil, 2011).

Conclusions

The training program using exercise showed a statistically significant improvement for assistance exercises on barbell speed, velocity (vertical, horizontal) for snatch lift and performance weightlifters. Interest in using assistance exercises for snatch and private exercises of pull, power snatch and squat snatch has an important role in the success of the performance of the snatch. Training according to power curve, speed and time of the barbell trajectory and muscle working performance. The need for evaluation of barbell trajectory during the performance by modern techniques for analysis of kinetic activity links it with training programs for weightlifters. These results must be taken into account by the coaches and weightlifters to use the assistance exercises for snatch to improve the kinetic performance and the level of achievement lifting snatch for weightlifters.

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Appendix 1. Assistance exercises for the snatch program training

PREPARATORY PHASE								
		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (1) weekly repetitions : 300 reps		Snatch 80% 3s x 3r	power Snatch 80% 2s x 3r 85% 3s x 2r	Snatch 80% 3s x 3r	No training	power Snatch 80% 2s x 3r 85% 3s x 2r	Snatch 80% 2s x 3r	No training
		power Clean 80% 2s x 3r 85% 2s x 1r	Clean 80% 4s x 2r 80% 2s x 1r	power Clean 80% 2s x 2r 85% 1s x 2r		Clean 80% 4s x 2r 85% 1s x 2r	power Clean 85% 2s x 2r 90% 1s x 2r	
		Jerk 80% 2s x 3r 85% 1s x 2r	power Jerk 80% 4s x 2r	Jerk 80% 2s x 3r 85% 1s x 2r		power Jerk 80% 4s x 3r	Pull Clean 80% 2s x 2r 90% 2s x 2r	
		Pull Clean 80% 2s x 3r 85% 2s x 2r	Overhead Squat 80% 2s x 3r 85% 3s x 1r 80% 2s x 3r	Front Squa 80% 2s x 3r 85% 3s x 2r		Overhead Squat 80% 2s x 3r 85% 3s x 1r 80% 3s x 1r	Good Morning 80% 2s x 3r 85% 3s x 2r	
		Good Morning 80% 2s x 3r 85% 3s x 2r	Pull Snatch 880% 2s x 3r 85% 2s x 2r	Good Morning 80% 2s x 3r 85% 3s x 2r		Pull Snatch 80% 2s x 3r 85% 2s x 2r	Bench Press 85% 5s x 1r	
		Front Squa 80% 2s x 3r 85% 3s x 2r	Squa 80% 2s x 5r	Bench Press 80% 12s x 6r		Squa 80% 2s x 5r	Abdominal 80% 4s x 1r	
		Abdominal 80% 1s x 5r				Bench Press 80% 1s x 5r	Squa 80% 2s x 5r	
Total of reps	Technical	17	10	17		10	6	
	Assistance	45	55	35		60	45	
	Total	62	65	52		70	51	
Average of intensity	Technical	81.6%	82.5%	81.6%		82.5%	85%	
	Assistance	82.5%	81.5%	82.1%		81.5%	84.3%	
	Total	82%	82%	80%		82%	84.6%	
Average weekly intensity 82% Technical exercises = 60 reps Assistance Exercises =240 reps								
The first number is the the intensity ...% of 1RM, the second. number is set and the third is reps								

		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (2) weekly repetitions : 350 reps		Snatch 80% 3s x 3r 85% 1s x 2r	Power Snatch 80% 2s x 3r 85% 3s x 2r 90% 2s x 2r	Snatch 80% 3s x 3r 85% 1s x 2r	No training	power Snatch 80% 2s x 3r 85% 3s x 2r	Snatch 80% 2s x 3r	No training
		power Clean 80% 2s x 3r 85% 1s x 2r	Clean 80% 4s x 2r 85% 2s x 2r	power Clean 80% 2s x 2r 85% 1s x 2r		Clean 80% 4s x 2r 85% 2s x 2r	power Clean 80% 2s x 2r 85% 1s x 2r	
		Jerk 80% 2s x 3r 85% 2s x 2r	power Jerk 80% 4s x 2r 85% 2s x 3r	Jerk 80% 2s x 3r 85% 1s x 2r		Pull Snatch 80% 2s x 2r 85% 2s x 2r 90% 1s x 1r	Pull Clean 80% 2s x 2r 85% 1s x 2r 90% 1s x 2r	
		Pull Clean 80% 2s x2 r 85% 2s x 2r 90% 1s x 2r	Overhead Squat 80% 2s x 3r 85% 3s x 1r 85% 2s x 3r	Front Squa 80% 2s x 3r 85% 3s x 2r		power Jerk 80% 2s x 4r	Squa 80% 2s x 5r	
		Front Squa 80% 2s x 3r 85% 3s x 2r	Pull Snatch 80% 2s x 2r 85% 2s x 2r 90% 2s x 2r	Good Morning 80% 2s x 3r X 23 % 85		Overhead Squat 80% 2s x 3r 85% 3s x 1r 80% 2s x 3r	Good Morning 80% 2s x 3r 85% 1s x 2r	
		Good Morning 80% 2s x 3r 85% 3s x 2r 80% 2s x 3r	Squa 80% 21s x 5r 85% 2s x 2r 80% 2s x 3r	Bench Press 80% 1s x 5r 85% 1s x 5r		Squa 80% 2s x 5r 80% 2s x 2r	Bench Press 80% 1s x 5r	
		Abdominal 80% 1s x 5r				Bench Press 80% 1s x 5r		
Total of reps	Technical	21	12	19		12	6	
	Assistance	53	87	40		63	37	
	Total	74	99	59		75	43	
Average of intensity	Technical	82.5%	82.5%	82.5%		82.5%	85%	
	Assistance	83%	83.2%	82.5%		82.5%	84.2%	
	Total	82.75%	82.8%	82.5%		82.5%	84.6%	
Average weekly intensity 80.6 % Technical exercises = 70 reps Assistance Exercises =280 reps								

		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (3) weekly repetitions : 300 reps		Snatch 80% 3s x 3r	power Snatch 80% 2s x 3r 85% 2s x 2r 95% 1s x 2r	Snatch 80% 2s x 3r 90% 1s x 1r 95% 1s x 1r 100% 1s x 1r	No training	power Snatch 80% 2s x 3r 85% 2s x 2r 95% 1s x 2r	Snatch 80% 2s x 3r	No training
		power Clean 80% 2s x 3r 90% 1s x 2r	Clean 80% 4s x 2r 85% 1s x 2r	power Clean 85% 2s x 2r 90% 1s x 2r		Clean 80% 4s x 2r 85% 1s x 2r	power Clean 85% 2s x 2r 90% 1s x 2r	
		Jerk 80% 2s x 3r 90% 1s x 2r	power Jerk 85% 4s x 2r	Jerk 80% 2s x 3r 90% 1s x 2r		power Jerk 95% 4s x 2r	Pull Clean 85% 2s x 2r 95% 2s x 2r	
		Pull Clean 80% 2s x 2r 90% 2s x 2r	Overhead Squat 80% 2s x 3r 90% 3s x 1r 95% 2s x 3r	Front Squa 80% 2s x 3r 90% 2s x 3r 95% 1s x 2r		Overhead Squat 80% 2s x 3r 90% 3s x 1r 95% 2s x 3r	Good Morning 80% 2s x 3r 85% 2s x 2r 90% 1s x 2r	
		Front Squa 80% 2s x 3r 90% 3s x 2r	Pull Snatch 80% 2s x 3r 95% 1s x 2r 100% 1s x 2r	Good Morning 80% 2s x 3r 90% 2s x 2r 95% 1s x 2r		Pull Snatch 80% 2s x 3r 85% 2s x 2r	Bench Press 80% 1s x 5r	
		Good Morning 80% 2s x 3r 85% 3s x 2r	Squa 85% 1s x 4r 90% 1s x 3r 95% 1s x 3r	Bench Press 85% 1s x 3r 95% 1s x 2r		Squa 85% 1s x 4r 95% 1s x 3r 95% 1s x 3r	Squa 85% 1s x 4r 90% 1s x 3r 95% 1s x 3r	
		Abdominal 85% 1s x 5r				Bench Press 85% 1s x 3r 95% 1s x 2r	Abdominal 85% 1s x 4r	
Total of reps	Technical	17	10	17		10	6	
	Assistance	45	55	35		60	45	
	Total	62	65	52		70	51	
Average of intensity	Technical	86.6%	83.3%	90.8%		82.5%	85%	
	Assistance	85.6%	90%	89%		88.9%	87.3%	
	Total	86.1%	86.6%	90%		85.7%	86.1%	
Average weekly intensity 86.6 % Technical exercises = 60 reps Assistance Exercises =240 reps								

		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (4) weekly repetitions : 300 reps		Snatch 85% 3s x 3r	power Snatch 80% 2s x 3r 85% 2s x 2r 95% 1s x 2r	Snatch 80% 3s x 3r	No training	power Snatch 80% 2s x 3r 90% 3s x 2r	Snatch 80% 2s x 3r	No training
		power Clean 80% 2s x 3r 90% 1s x 2r	Clean 80% 2s x 2r 85% 2s x 2r 95% 1s x 2r	power Clean 80% 2s x 2r 85% 1s x 2r		Clean 85% 42s x 2r 95% 1s x 2r	power Clean 80% 2s x 2r 85% 1s x 2r	
		Jerk 80% 2s x 3r 85% 1s x 2r	power Jerkر 80% 2s x 3r 95% 1s x 2r	Jerk 80% 2s x 3r 85% 1s x 2r		power Jerk 85% 2s x 4r	Pull Clean 80% 2s x 2r 85% 2s x 2r	
		Pull Clean 85% 2s x 2r 90% 2s x 2r	Overhead Squat 80% 2s x 3r 85% 3s x 1r 90% 2s x 3r	Good Morning 80% 2s x 3r 85% 3s x 2r		Overhead Squat 80% 2s x 3r 90% 3s x 1r 95% 2s x 3r	Good Morning 80% 2s x 3r 85% 3s x 2r	
		Good Morning 80% 2s x 3r 85% 3s x 2r	Pull Snatch 80% 2s x 3r 85% 2s x 2r	Bench Press 80% 1s x 5r		Pull Snatch 80% 2s x 3r 90% 2s x 2r	Bench Press 80% 1s x 5r	
		Front Squa 80% 2s x 3r 90% 3s x 2r	Squa 80% 1s x 5r 90% 1s x 3r 100% 1s x 2r	Front Squa 80% 2s x 3r 85% 3s x 2r		Bench Press 85% 1s x 5r	Squa 80% 2s x 5r	
		Abdominal 85% 1s x 5r				Squa 80% 1s x 5r 90% 1s x 3r 90% 1s x 2r	Abdominal 80% 1s x 4r	
Total of reps	Technical	17	10	17		10	6	
	Assistance	45	55	35		60	45	
	Total	62	65	52		70	51	
Average of intensity	Technical	83.3%	86.6%	81.6%		90%	%85	
	Assistance	86.2%	86.1%	82.1%		89.1%	81.8%	
	Total	84.7%	86.3%	81.8%		89.5%	83.4%	
Average weekly intensity 85.1 % Technical exercises = 60 reps Assistance Exercises =240 reps								

		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (5) weekly repetitions : 250 reps		Snatch 90% 1s x 3r 85% 1s x 2r 90% 1s x 1r 95% 1s x 1r 100% 1s x 1r	power Snatch 80% 2s x 3r 90% 2s x 2r	Snatch 85% 1s x 3r 90% 1s x 2r 95% 1s x 1r	No training	power Snatch 90% 1s x 2r 90% 2s x 2r	Snatch 85% 1s x 2r 90% 1s x 2r 95% 1s x 1r 100% 1s x 1r	No training
		power Clean 85% 2s x 3r 95% 1s x 2r	Clean 80% 2s x 3r 85% 1s x 1r	power Clean 85% 2s x 2r 90% 1s x 1r		Clean 80% 2s x 3r 85% 1s x 2r	power Clean 85% 2s x 2r 90% 1s x 1r	
		Jerk 85% 2s x 2r 95% 1s x 2r	power Jerk 80% 2s x 3r	Jerk 80% 2s x 3r 85% 1s x 2r		power Jerk 80% 2s x 3r	Pull Clean 80% 2s x 2r 90% 1s x 2r	
		Pull Clean 905% 2s x 2r 95% 2s x 2r	Overhead Squat 80% 2s x 3r 85% 1s x 5r 80% 2s x 3r	Good morning with knees bend 80% 2s x 3r 85% 2s x 2r		Overhead Squat 80% 2s x 2r 85% 1s x 3r 80% 2s x 2r	Good morning with knees bend 80% 2s x 3r 85% 2s x 2r	
		Good Morning 90% 2s x 3r 95% 2s x 2r	Pull Snatch 80% 2s x 2r 80% 2s x 2r	Bench Press 80% 1s x 4r		Pull Snatch 80% 2s x 2r 85% 2s x 2r	Bench Press 80% 1s x 4r	
		Front Squa 85% 2s x 3r 95% 2s x 2r 100% 1s x 2r	Squa 80% 2s x 4r	Front Squa 85% 2s x 3r 95% 2s x 2r 100% 1s x 2r		Squa 80% 2s x 4r	Squa 80% 2s x 4r	
		Abdominal 80% 1s x 3r				Bench Press 80% 1s x 4r	Abdominal 80% 1s x 4r	
Total of reps	Technical	14	8	14		8	6	
	Assistance	41	44	31		47	37	
	Total	55	52	45		55	43	
Average of intensity	Technical	90%	82.5	87%		82.5%	92.5%	
	Assistance	82.6%	82.2%	87.5%		82%	83.7%	
	Total	86.3%	82.2%	87.2%		82.2%	88.1%	
Average weekly intensity 85.2 % Technical exercises = 50 reps Assistance Exercises =200 reps								
COMPETITION PHASE								
		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (6) weekly repetitions : 350 reps		Snatch 85% 3s x 3r 95% 1s x 2r	power Snatch 85% 2s x 3r 90% 2s x 3r 95% 2s x 2r	Snatch 85% 3s x 3r 90% 1s x 2r	No training	power Snatch 85% 2s x 3r 90% 3s x 2r	Snatch 85% 1s x 3r 95% 1s x 2r 100% 1s x 12r	No training
		power Clean 85% 2s x 3r 100% 1s x 2r	Clean 90% 4s x 2r 95% 2s x 2r	power Clean 85% 2s x 2r 95% 1s x 2r		Clean 85% 4s x 2r 95% 1s x 2r 100% 1s x 1r	power Clean 85% 2s x 2r 90% 1s x 2r	
		Jerk 85% 2s x 3r 95% 2s x 2r	power Jerk 85% 4s x 2r 95% 2s x 3r	Jerk 90% 2s x 3r 100% 1s x 2r		power Jerk 85% 4s x 2r	Pull Clean 80% 2s x 2r 90% 2s x 2r 100% 1s x 1r 95% 1s x 1r	
		Pull Clean 80% 2s x 2r 90% 2s x 2r 100% 1s x 2r	Overhead Squat 80% 2s x 3r 85% 3s x 1r 80% 2s x 3r	Good morning with knees bend 85% 2s x 3r 95% 2s x 3r		Overhead Squat 85% 2s x 3r 90% 1s x 3r 95% 2s x 3r	Squa 85% 2s x 5r	
		Front Squa 85% 2s x 3r 90% 2s x 3r	Pull Snatch 85% 2s x 2r 90% 2s x 2r 95% 2s x 2r	Bench Press 85% 2s x 4r 90% 2s x 5r		Pull Snatch 85% 2s x 2r 90% 2s x 2r 100% 1s x 1r	Good morning with knees bend 85% 2s x 3r 90% 3s x 2r	
		Good morning with knees bend 85% 2s x 3r 90% 3s x 2r 95% 2s x 3r	Squa 80% 2s x 5r 85% 2s x 2r 80% 2s x 3r	Front Squa 85% 2s x 3r 95% 2s x 3r		Bench Press 85% 1s x 5r	Bench Press 85% 1s x 3r 95% 1s x 2r	
		Abdominal 90% 1s x 5r				Squa 85% 2s x 5r 90% 2s x 2r	Abdominal 90% 1s x 4r	
Total of reps	Technical	21	12	19		12	6	
	Assistance	53	77	50		63	37	
	Total	74	89	69		75	43	
Average of intensity	Technical	90 %	92.5 %	92.5 %		91.6 %	91.6 %	
	Assistance	88.7%	86.4%	90%		88.7%	89%	
	Total	89.3%	89.4%	91.2%		90.1%	90.3%	
Average weekly intensity 90.6 % Technical exercises = 70 reps Assistance Exercises =280 reps								

		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (7) weekly repetitions : 300 reps		Snatch 85% 2s x 3r 90% 2s x 4r 95% 1s x 2r	power Snatch 85% 2s x 3r 90% 3s x 2r 95% 21s x 2r	Snatch 85% 3s x 3r 95% 2s x 2r 100% 1s x 2r	No training	power Snatch 85% 3s x 3r 95% 2s x 2r 100% 1s x 2r	Snatch 85% 2s x 3r 90% 1s x 2r 95% 1s x 1r	No training
		power Clean 85% 2s x 3r 95% 1s x 2r	Clean 85% 4s x 3r 95% 2s x 2r 90% 2s x 4r	power Clean 85% 2s x 3r X 2 1 %95		Clean 85% 4s x 3r 95% 1s x 2r 100% 1s x 1r 95% 2s x 2r	power Clean 85% 2s x 2r 95% 1s x 1r 100% 1s x 1r	
		Jerk 85% 2s x 3r 90% 2s x 2r	power Jerk 85% 2s x 3r	Jerk 85% 2s x 3r 90% 1s x 3r 95% 1s x 2r 100% 1s x 1r		power Jerk 90% 2s x 2r 100% 1s x 2r	Pull Clean 85% 2s x 3r 90% 2s x 2r	
		Pull Clean 85% 2s x 3r 95% 2s x 2r	Overhead Squat 85% 2s x 3r 100% 1s x 2r	Good morning with knees bend 90% 2s x 3r 95% 2s x 2r		Overhead Squat 85% 2s x 3r 90% 1s x 2r	Good morning with knees bend 85% 2s x 3r 95% 2s x 2r	
		Good Morning 85% 2s x 3r 95% 3s x 2r	Pull Snatch X 2 2 %85 95% 2s x 2r	Bench Press 85% 1s x 5r 90% 1s x 4r		Pull Snatch 85% 2s x 3r 95% 2s x 2r 100% 1s x 1r	Bench Press 90% 1s x 4r	
		Abdominal 90% 1s x 4r	Squa 85% 2s x 4r	Front Squa 85% 2s x 3r 90% 2s x 2r		Squa 85% 2s x 4r	Squa 85% 2s x 2r 95% 1s x 2r 100% 1s x 1r	
		Front Squa 85% 2s x 3r 95% 1s x 2r 100% 1s x 2r				Bench Press 90% 1s x 5r		
Total of reps	Technical	24	20	21		16	9	
	Assistance	44	46	35		50	37	
	Total	64	64	65		66	50	
Average of intensity	Technical	89%	91.6 %	91.4 %		93.4%	91.6 %	
	Assistance	91%	89.4%	89.3%		91.6 %	91.8 %	
	Total	90%	90.5 %	90.3 %		92.6%%	91.7 %	
Average weekly intensity 92 % Technical exercises = 90 reps Assistance Exercises =210 reps								
COMPETITION TAPER WEEK								
		Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Week (8) weekly repetitions : 180 reps		Snatch 80% 2s x 3r 85% 2s x 3r 90% 2s x 2r	No training	power Snatch 80% 2s x 3r 85% 2s x 1r	No training	Snatch 80% 2s x 3r 85% 2s x 3r	No training	No training
		Clean and Jerk 80% 3s x 4r 85% 2s x 2r 90% 2s x 2r		Clean and Jerk 80% 3s x 3r 85% 2s x 3r 90% 1s x 1r		Clean and Jerk 80% 3s x 3r 85% 2s x 2r		
		power Snatch 80% 2s x 3r		Overhead Squat 80% 2s x 2r 85% 1s x 2r		power Snatch 80% 3s x 3r 850% 2s x 3r		
		power Clean 80% 2s x 3r 85% 2s x 4r		power Jerk 80% 2s x 3r 85% 31s x 3r		power Jerk 80% 3s x 3r 85% 2s x 3r		
		Squa 80% 2s x 4r 85% 1s x 3r		Good Morning 80% 2s x 3r 85% 2s x 3r		Good Morning 80% 2s x 3r		
Total of reps	Technical	36		14		22		
	Assistance	31		41		36		
	Total	67		55		58		
Average of intensity	Technical	85 %		85 %		82.5 %		
	Assistance	82 %		82.5 %		82 %		
	Total	83.5 %		83.7 %		82.2 %		
Average weekly intensity 83 % Technical exercises = 72 reps Assistance Exercises =108 reps								