

Decline in Relative Strength with Increasing the Body Weight: a Study on Heavy Weight Categories Powerlifters

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ABSTRACT

Relative strength is the amount of strength to the body size. It is the strength to body weight ration. When body size is more, we generally understand that the strength is more with the player. In strength sports like weight lifting, powerlifting the strength of the individual is measured. In weight lifting, the total of snatch, clean and jerk are the factors to decide the winner; however, in powerlifting the total of squat, bench press and deadlift are considered. In this study, 54 senior class powerlifter and 54 junior class powerlifters are treated as subjects. All the subjects from heavy weight categories such as 105kg, 120kg and above 120kg categories are highlighted. The results of the study revealed that the relative strength is decreasing with the increased body weight.

1. Introduction

Powerlifting is one of the major strength sports in India. Every year the competitions for different categories are conducted. The age categories are sub junior, junior, senior Master I, Master II, Master III and Master IV for men and women separately. There are weight categories for men (08) and for women (07).

There are three events in powerlifting. They are squat, bench press and deadlift. In the competition first it measures lower body strength (squat) then upper body strength (bench press) and at the end deadlift event. In all the three events there will be three attempts. The highest successful score of squat, bench press and deadlift are considered for total weight for awarding the winners.

Absolute strength is the maximum amount of force exerted, regardless of muscle or body size. In powerlifting the actual performance of the competitor in squat, bench press and deadlift are may be considered as absolute strength to the player's bodyweight.

Relative strength is the amount of strength to body size, or how strong someone is compared to their size. The relative strength is measured by dividing the actual performance (in weight) by the player's actual body weight. It is the strength to body weight ratio.

In the competition the competitor may reduce his/her bodyweight according to the strategies to get the medals. One may reduce or other may increase the weight when he/she goes to the weigh-in prior to the competition. The reduction or increasing the body mass may affect the player's performance as well as relative strength. The reducing or increasing body weight may not impact more on heavy weight classes. Because in heavy class category the lifters are having more fat which can be easily burnt to reduce body weight without any harmful attempts.

The study aims to highlight the relative strength variation during the increased body weight of individuals.

2. Methodology

Data is collected from the results of national level senior and junior level competitions organized by powerlifting in India. The three years results were taken into consideration. In male section heavy weight class (105kg, 120kg, and +120kg) powerlifting

results best six performance of each class in junior and senior category was selected for this study. 54 from senior and 54 from junior category results were taken as subjects for this study.

3. Statistical analysis

All the data was analyzed by using proper statistical techniques. Relative strength was calculated for all powerlifters at each competition by dividing their highest performance by their bodyweight. The relative strength score was calculated for each lift such as squat, bench-press and deadlift. The athletes weigh in occurs one to two hours before the commencement of competition. The nutritional and body weight management strategies may cause to slight variation on relative strength performance.

Table I shows the mean value of absolute weight of lifters performed in the competition. It is the maximum lift performed in heavy weight categories such as 105kg, 120kg and +120 kg category in male junior and senior section at the national level competitions. The absolute strength of squat, bench press and deadlift were taken in consideration separately.

Table I. Absolute weight lifted in junior and senior category for the squat, bench-press and deadlift

Category		105kg		120kg		+120 kg	
		Mean	SD	Mean	SD	Mean	SD
Junior	Squat	267.39	35.39	284.83	46.21	305.44	49.75
	Bench press	166.61	35.38	172.89	29.51	187.47	30.42
	Dead lift	251.56	27.51	250.08	31.31	263.03	32.69
Seniors	Squat	347.83	28.60	356.53	21.64	356.25	44.32
	Bench press	212.22	25.52	221.11	18.77	222.64	30.66
	Dead lift	291.11	26.45	296.53	24.36	287.5	27.84

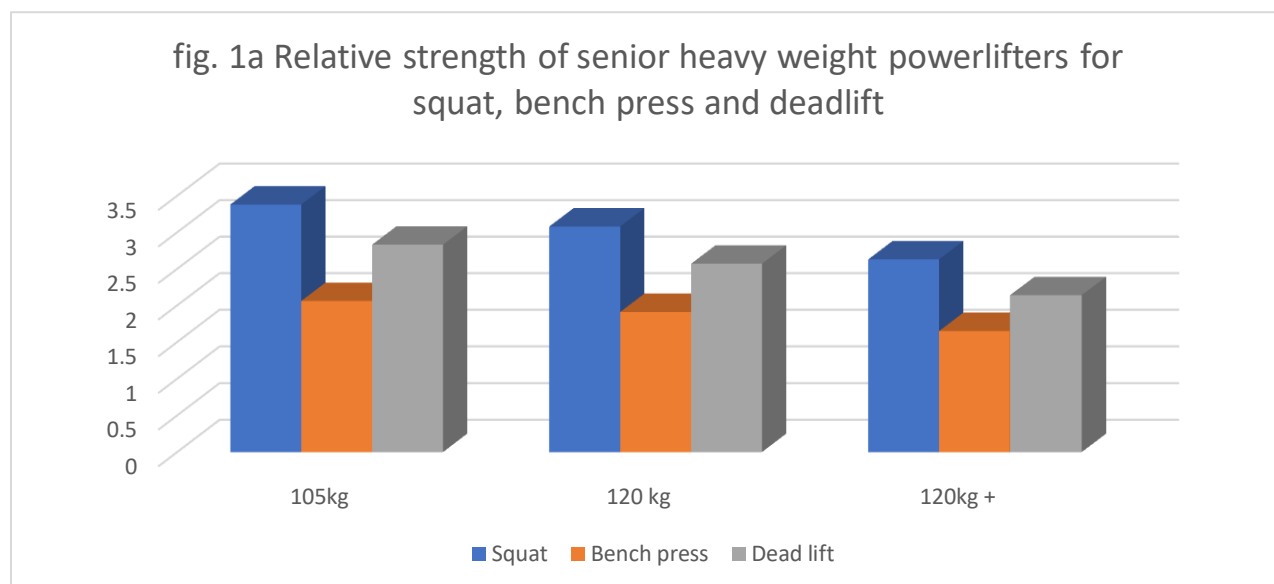


Figure 1a shows the relative strength for the squat, bench-press and deadlift in senior male category in heavy weight classes. It is observed that the 105kg class had the highest relative strength score than 120kg and +120kg class. The squat relative strength score were decreasing from 105kg weight class (3.38 0.26) to 120kg class (3.08 0.18) and +120kg weight class (2.63 0.24). The bench press relative strength score also in decreasing form 105kg weight class (2.06 0.24) to 120kg class (1.91 0.17) and +120kg weight class (1.65 0.20). The dead lift relative strength score also found decreasing form 105kg weight class (2.83 0.27) to 120kg class (2.57 0.27) and +120kg weight class (2.14 0.24).

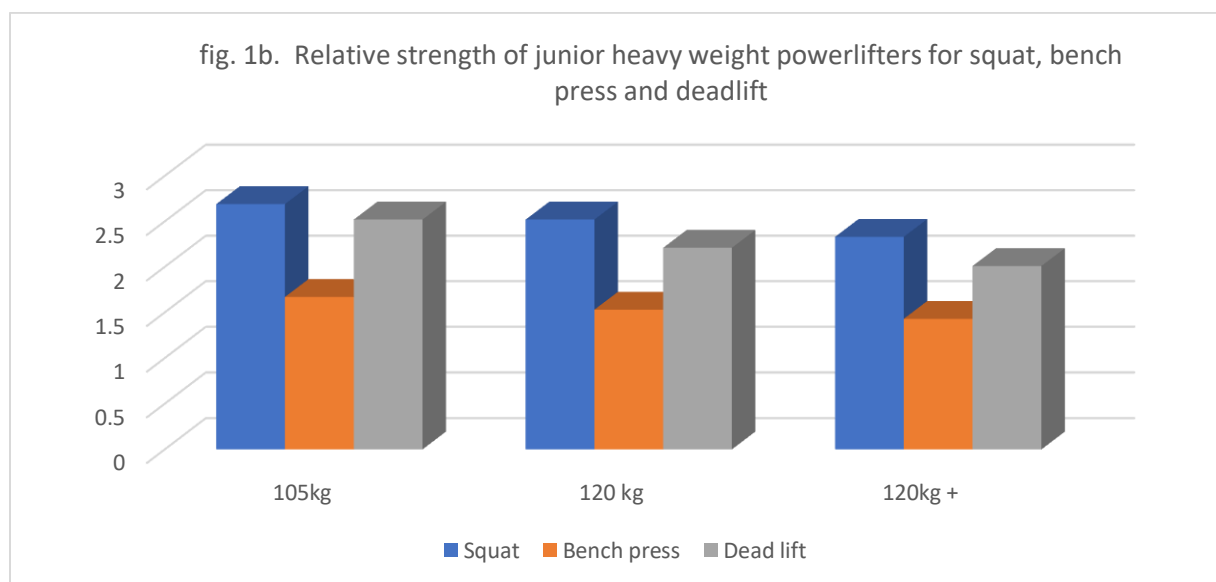


Figure 1b shows the relative strength for the squat, bench-press and deadlift in junior male category in heavy weight classes. It is observed that the 105kg class had the highest relative strength score than 120kg and +120kg class. The squat relative strength score were decreasing from 105kg weight class (2.69 0.39) to 120kg class (2.52 0.39) and +120kg weight class (2.33 0.42). The bench press relative strength score also in decreasing form 105kg weight class (1.67 0.36) to 120kg class (1.53 0.27) and +120kg weight class (1.43 0.27). The dead lift relative strength score also found decreasing form 105kg weight class (2.52 0.29) to 120kg class (2.21 0.30) and +120kg weight class (2.01 0.33).

4. Discussion

The purpose of this study is to find out the strength to body weight ratio variations in heavy weight class powerlifters. It is investigated on selected three body weight classes in junior and senior section male powerlifting. The result shows that the strength to body weight ratio for squat is greater than strength to body weight ratio for Bench press and deadlift in junior and seniors respectively.

It was observed that the relative strength ratio is decreasing when the body mass increasing in junior and senior section heavy weight categories. These finding was similar to those investigation done by Christopher Latella (2018) on powerlifters.

The both upper body relative strength and lower body relative strength were decreasing in both junior and senior male heavy body weight class powerlifting categories. Christopher Latella (2018) reported similar findings on their investigation.

The results shows that relative strength decline ratio more in first (105kg) to second (120 kg) weight class than second to third (+120 kg) weight class. It is understood that the decline ratio is more when the body mass is increasing. The lower body relative strength (Squat) decline ratio is higher than upper body relative strength (Bench press) declining. The decline ratio in senior heavy weight class is higher than junior heavy weight class powerlifters.

5. Conclusion

The objective of the study was to analyze the relative strength of powerlifters in different bodyweight categories. For these three years national level senior and junior level powerlifting championships, the results were taken into consideration. The best six performance of male section in heavy weight class (105kg, 120kg, and +120kg) category results was analyzed. The results of this study shows that there was a difference in relative strength between juniors and senior of heavy weight class male powerlifters. The relative strength is in decline with increasing body mass. The less body mass shows higher relative strength and heavy weight class male powerlifters are comparatively low in relative strength. This result may help the powerlifters and the coaches to adopt systematic training according to the relative strength.

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