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Comparative Study Of Health-Related Physical Capacity Components Of Young Weightlifting And Powerlifting Athletes

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Abstract:

The aim of this study was to conduct a comparative study of health-related physical fitness components in young weightlifting and powerlifting athletes. In this research, weightlifting and powerlifting athletes from various districts of Maharashtra state were selected for the study. A total of 40 athletes were selected, comprising 20 weightlifters and 20 powerlifters, all within the age group of 18 to 23 years. To measure the health-related physical fitness of the selected subjects, certain components were chosen, including cardiovascular endurance, flexibility, and muscular endurance. These components were then tested using the Cooper 12-minute run/walk test, sit-and-reach test, and sit-up test, respectively. A Student's t-test and Average was used to analyze the scores obtained from the tests and to compare the health-related physical fitness of weightlifting and powerlifting athletes. The significance level for this study was set at 0.05. It was concluded that there are significant differences in health-related physical fitness and its components—flexibility, cardiovascular endurance, and muscular endurance—between weightlifting and powerlifting athletes. Weightlifters exhibited higher levels of health-related physical fitness and its components (flexibility, cardiovascular endurance, and muscular endurance) compared to powerlifters.

Keywords: Health-Related Physical Capacity, Weightlifting and Powerlifting Athletes

I. INTRODUCTION:

In today's modern era, everyone's health is deteriorating, primarily due to their lifestyle. In this day and age, almost every person has access to every comfort and convenience, which has led to a decrease in physical activity. It is essential to emphasize the importance of health-related fitness to every individual today so that they can maintain good health. Similarly, health-related fitness is also of great importance in the lives of athletes. It is on the basis of fitness that they can take their sport to a higher level. This requires the proper functioning of all the muscles and organs of the body so that they can remain free from injuries and illnesses associated with athletic performance. An athlete needs excellent cardiovascular and pulmonary function for optimal performance, allowing them to perform their skills without fatigue. Weightlifting and powerlifting also require various physical capabilities.

Powerlifting is a sport where athletes utilize their full strength, whereas in weightlifting, athletes require a combination of strength and speed. Powerlifters focus heavily on strengthening their legs, lower back, shoulders, and chest through exercises that involve lifting maximum weight. This develops their muscles' ability to withstand significant stress. Weightlifters, on the other hand, are observed to lift weights quickly, requiring superior relative strength and specific training for this purpose. Weightlifting is a highly dynamic activity, resulting in greater flexibility among weightlifters. They perform skills like the snatch and clean and jerk, which heavily utilize their ankles, hips, and shoulders. These movements require excellent mobility and coordination to be performed efficiently and effectively, allowing the athlete to achieve optimal performance. Regarding body composition, weightlifters typically have leaner physiques. They maintain low body fat percentages to stay within their weight categories and possess high muscle density. Powerlifters, however, tend to have significantly greater muscle mass, especially in the heavier weight classes. Several studies have shown that they may have a slightly higher body fat percentage compared to weightlifters. Weightlifting and powerlifting involve different training methodologies, primarily differing in speed and intensity. This difference can also impact cardiovascular health, which is why researchers have chosen to investigate this topic.

II. METHODOLOGY:

In this research, weightlifting and powerlifting athletes from various districts of Maharashtra state were selected for the study. A total of 40 athletes were selected, comprising 20 weightlifters and 20 powerlifters, all within the age group of 18 to 23 years. To measure the health-related physical fitness of the selected subjects, certain components were chosen, including cardiovascular endurance, flexibility, and muscular endurance. These components were then tested using the Cooper 12-minute run/walk test, sit-and-reach test, and sit-up test, respectively.

III. STATISTICAL ANALYSIS:

A Student's t-test and Average was used to analyze the scores obtained from the tests and to compare the health-related physical fitness of weightlifting and powerlifting athletes. The significance level for this study was set at 0.05.

Table No. 1: Showing comparison between weightlifting and powerlifting athletes in cardiovascular endurance

Group	N	Mean	SD	SE	MD	Ot	df	Tt
Weightlifting	20	42.20	6.30	2.09	5.30	2.532	38	2.024
Powerlifting	20	36.90	6.92					

Table-1 reveals that there is significant difference in cardiovascular endurance between weightlifting and powerlifting athletes. The obtained t-value of 2.532 is more than the table value of 2.024.

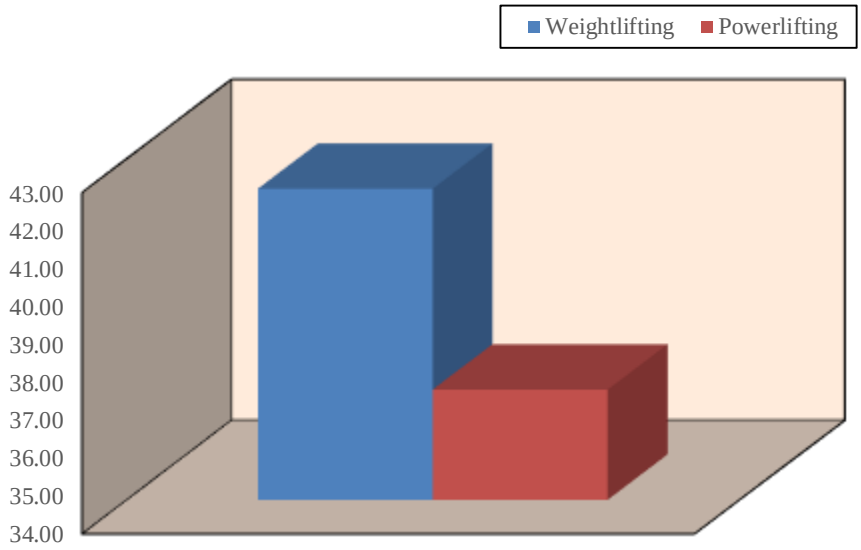

Fig. No. 1: This graph shows a comparison of the mean cardiovascular endurance between weightlifting and powerlifting athletes.

Table No. 2: Showing comparison between weightlifting and powerlifting athletes in flexibility

Group	N	Mean	SD	SE	MD	Ot	df	Tt
Weightlifting	20	2530.05	148.68	59.82	154.80	2.588	38	2.024
Powerlifting	20	2375.25	222.42					

Table-2 reveals that there is significant difference in flexibility between weightlifting and powerlifting athletes. The obtained t-value of 2.588 is more than the table value of 2.024.

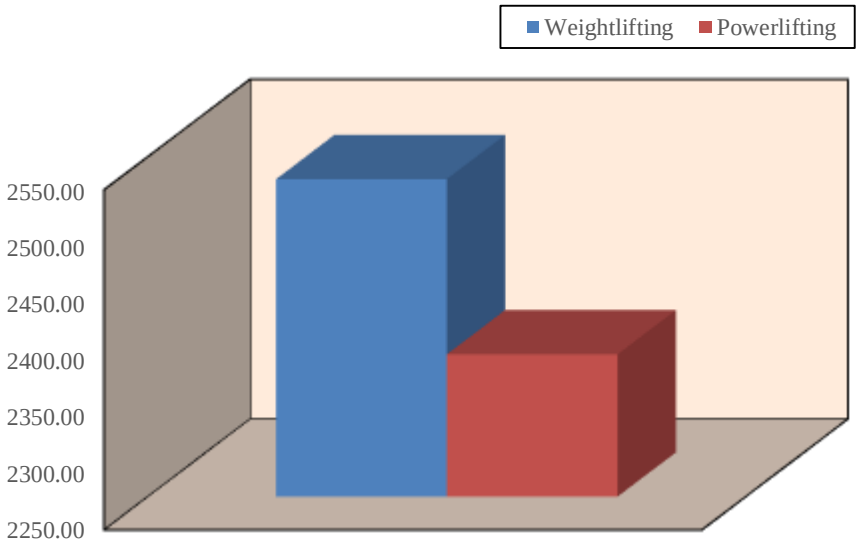

Fig. No. 2: This graph shows a comparison of the mean flexibility between weightlifting and powerlifting athletes.

Table No. 3: Showing comparison between weightlifting and powerlifting athletes in muscular endurance

Group	N	Mean	SD	SE	MD	Ot	df	Tt
Weightlifting	20	24.95	3.12	1.18	5.40	4.564	38	2.024
Powerlifting	20	19.55	4.27					

Table-3 reveals that there is significant difference in muscular endurance between weightlifting and powerlifting athletes. The obtained t-value of 4.564 is more than the table value of 2.024.

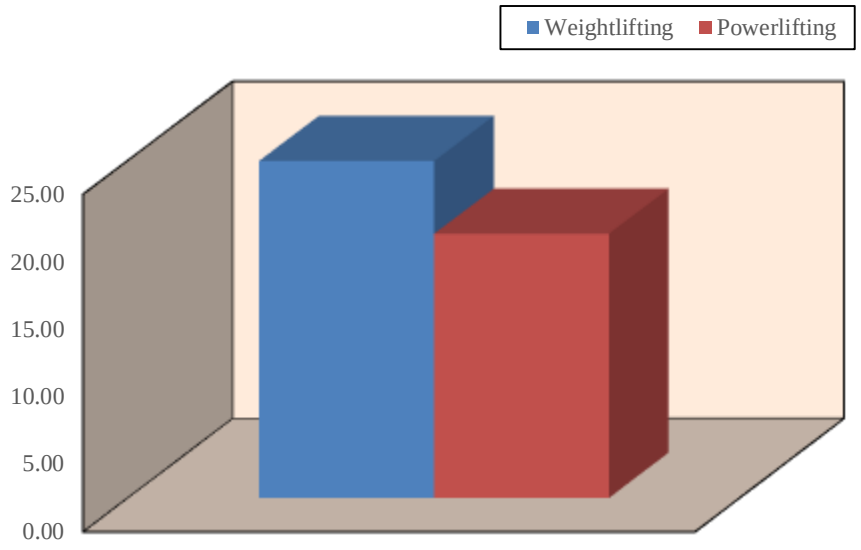

Fig. No. 3: This graph shows a comparison of the mean muscular endurance between weightlifting and powerlifting athletes.

Table No. 4: Showing comparison between weightlifting and powerlifting athletes in health-related physical fitness

Group	N	Mean	SD	SE	MD	Ot	df	Tt
Weightlifting	20	865.73	49.62	20.06	55.17	2.750	38	2.024
Powerlifting	20	810.57	74.72					

Table-4 reveals that there is significant difference in health-related physical fitness between weightlifting and powerlifting athletes. The obtained t-value of 2.532 is more than the table value of 2.024.

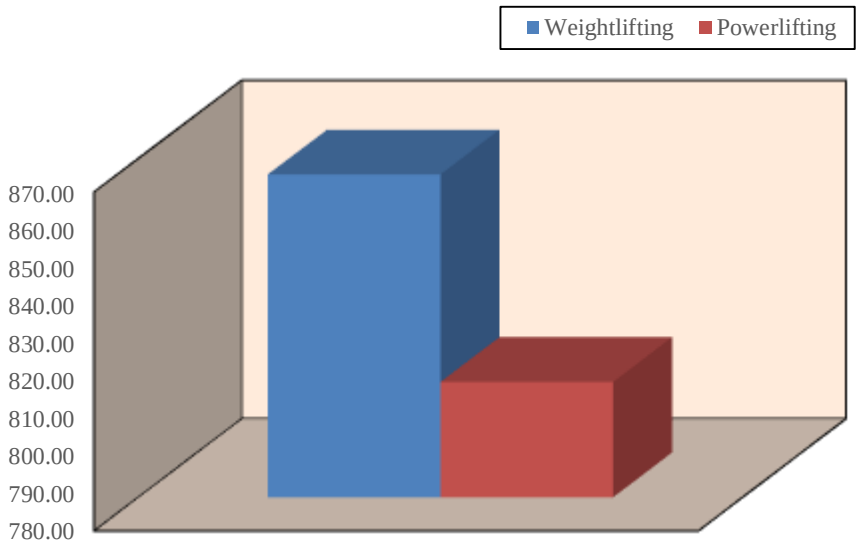

Fig. No. 4: This graph shows a comparison of the mean health-related physical fitness between weightlifting and powerlifting athletes.

IV. CONCLUSION:

It was concluded that there are significant differences in health-related physical fitness and its components—flexibility, cardiovascular endurance, and muscular endurance—between weightlifting and powerlifting athletes. Weightlifters exhibited higher levels of health-related physical fitness and its components (flexibility, cardiovascular endurance, and muscular endurance) compared to powerlifters. This may be due to the fact that the training given to weightlifters is designed to enhance flexibility, cardiovascular endurance, and muscular endurance. The nature of the weightlifting sport itself may also contribute to their superior flexibility, cardiovascular endurance, and muscular endurance. The researchers suggest that during athlete selection, emphasis should be placed on assessing flexibility, cardiovascular endurance, and muscular endurance to ensure the selection of a well-rounded athlete.

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