SUMMARY,
CONCLUSIONS
AND THE
RECOMMENDATIONS
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The purpose of the present study was to compare the physical fitness and physiological variables between the junior and senior female boxers and among the states. The first objective of the present study was to determine the characteristics of Physical variables of junior level female boxers of northern states of India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The second objective of the present study was to determine the characteristics of Physical variables of senior level female boxers of northern states of India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The third objective of the present study was to determine the characteristics of Physiological variables of junior level female boxers of northern states of India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The fourth objective of the present study was to determine the characteristics of Physiological variables of senior level female boxers of northern states of India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The fifth objective of the present study was to compare within state the physical variables between junior and senior level female boxers of northern states of India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The sixth objective of the present study was to compare within state the physiological variables between junior and senior level boxers of northern states of India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The seventh objective of the present study was to compare the physical variables of junior female level boxers among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The eighth objective of the present study was to compare the physical variables of senior level female boxers among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The ninth objective of the present study was to compare the physiological variables of junior level female boxers among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand). The tenth objective of the present study was to compare the physiological variables of senior level boxers among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand).
150 junior and senior women boxers in age group of 15 to 25 were selected by stratified and random method of sampling for the present study from Munirka (Delhi), Hisar, Rewari (Haryana), Khanna, Sangruar (Punjab), Alwar, Udepur (Rajasthan) and Almora, Nanital (Uttarakhand) participated in national competitions. Prior consent was taken from the respective coaches and all the players regarding the purpose and the procedure of data collection. The present study was conducted on 150 female boxers; 75 were junior and 75 were senior female boxers (thirty from each state with 15 junior and 15 senior boxers)

Speed was measured by conducting 50-yards dash. The score was recorded to the nearest tenth of a second. Agility was measured by conducting a 4 × 30 feet shuttle run. The score was recorded to the nearest tenth of a second. Abdominal strength was measured with the help of bent knee sit ups and the number of sit ups was taken as the score. Explosive strength was measured by (SBJ) the horizontal distance covered in feet/inches between the take off line and landing points on the both feet. Arm and shoulder strength was tested by the help of pull-ups test and the number of pull-ups was considered as the score of the test. Cardio-respiratory Endurance was measured by using the Appher’s 12-minute run/walk and the score was recorded to the nearest 50 yards/distance. Flexibility was measured by conducting the Sit and Reach test. The score was recorded in inches. Positive Breath Holding Capacity was tested by the help of clip on nose and with a stop watch. The score was recorded in second. Resting Heart Rate was assessed by the number of heart beats per minute by using Automatic Digital Blood Monitor, when the subject was under physical and mental rest. Blood pressure of the subjects was measured in mm.Hg by using Automatic Digital Blood Monitor.

In order to determine the characteristics of Physical fitness variables of junior level boxers of northern states of India, mean and standard deviation, minimum, maximum and range was used. In order to determine the characteristics of Physical fitness variables of senior level boxers of northern states of India, mean and standard deviation, minimum, maximum and range was used. In order to determine the characteristics of Physiological variables of junior level boxers of northern states of India, mean and standard deviation, minimum, maximum and range was used. In order to compare junior and senior level boxers of northern states
of India in relation to Physical fitness variables 't' test was used. In order to compare junior and senior level boxers of northern states of India in relation to Physiological variables 't' test was used. In order to compare difference among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand) in relation to Physical fitness variables ‘One Way Analysis of Variance’ was used. In order to compare among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand) in relation to Physiological variables ‘One Way Analysis of Variance’ was used. In order to compare among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand) in relation to Physiological variables ‘One Way Analysis of Variance’ was used. In order to compare among different states of northern India (Delhi, Haryana, Punjab, Rajasthan and Uttarakhand) in relation to Physiological variables ‘One Way Analysis of Variance’ was used.

CONCLUSION

The descriptive statistics of physical fitness variables for junior female boxers of Delhi, Haryana, Punjab, Rajasthan, Uttarakhand have been analyzed as under.

The results in speed showed that the junior boxers of Haryana possessed less time in comparison to the junior boxers of other states but the difference in mean score was non-significant.

The results in agility test showed that the junior boxers of Haryana possessed less time in comparison to the junior boxers of other states but the difference in mean score was non-significant.

The results in arm and shoulder strength showed that the junior boxers of Punjab possessed more in comparison to the junior boxers of other states but the difference in mean score was non-significant.

The results in flexibility showed that the junior boxers of Haryana were more flexible in comparison to the junior boxers of other states but the difference in mean score was non-significant.

But the results showed that the junior boxers of Haryana were better in abdominal strength in comparison to the junior boxers of other states. It had also been found that the boxers of Haryana state were having better mean score of 48.60 no. of sit ups in comparison to the junior boxers of the other states.
Similarly the results showed that the junior boxers of Haryana were better in explosive strength in comparison to the junior boxers of other states. It had also been found that the boxers of Haryana state were having better mean score of 7.99 feet in comparison to the junior boxers of the other states.

In this way the results showed that the junior boxers of Haryana were better in endurance in comparison to the junior boxers of other states. It had also been found that the boxers of Haryana state were having better mean score of 28.96 yards distance in comparison to the junior boxers of the other states.

The descriptive statistics of physical fitness variables for senior boxers of Delhi, Haryana, Punjab, Rajasthan and Uttarkhand has been analyzed as under.

The results in speed showed that the senior boxers of Haryana possessed less time in comparison to the senior boxers of other states but the difference in mean score was non-significant.

The results in agility test showed that the senior boxers of Haryana possessed less time in comparison to the senior boxers of other states but the difference in mean score was non-significant.

The results in arm and shoulder strength showed that the senior boxers of Punjab possessed more pull-ups in comparison to the senior boxers of other states but the difference in mean score was non-significant.

The results in explosive strength showed that the senior boxers of Rajasthan possessed more in comparison to the senior boxers of other states but the difference in mean score was non-significant.

The results in endurance showed that the senior boxers of Punjab possessed more in comparison to the senior boxers of other states but the difference in mean score was non-significant.

But the results showed that the senior boxer of Haryana, Punjab and Uttarakhand were better in abdominal strength in comparison to the senior boxers of other states. It had also been found the boxers of these states were having better mean score (49.80 no. of sit ups) in comparison to the senior boxers of other states.

Similarly results showed that the senior boxers of Haryana were better in flexibility in comparison to the senior boxers of other states. It had also been found
the boxers of these states were having better mean score (10.32 inches) in comparison to the senior boxer of other states.

The descriptive statistics of physiological variables for junior female boxers of Delhi, Haryana, Punjab, Rajasthan, Uttarakhand have been analyzed as under.

The results in resting heart rate showed that the junior boxers of Haryana lower in comparison to the junior boxers of other states but the difference in mean score was non-significant.

The results in blood pressure (systolic) showed that the junior boxers of Uttarakhand possessed less in comparison to the junior boxers of other states but the difference in mean score was non-significant.

The results in blood pressure (diastolic) showed that the junior boxers of Delhi possessed less in comparison to the junior boxers of other states but the difference in mean score was non-significant.

But results in positive breath holding capacity showed that the junior boxers of Punjab were better in comparison to the junior boxers of other states. It had also been found the boxers of Punjab state were having better mean score (54.46 sec.) in comparison to the junior boxers of other states.

The descriptive statistics of physiological variables for senior female boxers of Delhi, Haryana, Punjab, Rajasthan, Uttarakhand have been analyzed as under.

The results in resting heart rate showed that the senior boxers of Haryana were lower in comparison to the senior boxers of other states but the difference in mean score was non-significant.

The results in blood pressure (systolic) showed that the senior boxers of Haryana possessed less in comparison to the senior boxers of other states but the difference in mean score was non-significant.

The results in blood pressure (diastolic) showed that the senior boxers of Delhi possessed less in comparison to the senior boxers of other states but the difference in mean score was non-significant.

But results in positive breath holding capacity showed that the senior boxers of Haryana were better in comparison to the senior boxer of other states. It had also been
found the boxer of Punjab state were having better mean score (62.00 sec.) in comparison to the senior boxer of other states.

Significant difference were found between the junior and senior female boxers of Delhi for physical variables in relation to agility ($t=5.48$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance and in case of arm and shoulder strength ($t=2.14$), explosive strength ($t=2.09$) and in endurance ($t=2.72$) which were greater than tabulated of 2.05 at 0.05 level of significance. Whereas no significant difference were found in speed, abdominal strength and flexibility.

Significant difference were found between the junior and senior female boxers of Haryana for physical variables in relation to agility ($t=3.40$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance and in case of arm and shoulder strength ($t=2.33$) which were greater than tabulated of 2.05 at 0.05 level of significance. Whereas no significant difference were found in speed, abdominal strength, explosive strength, endurance and flexibility.

Significant difference were found between the junior and senior female boxers of Punjab for physical variables in relation to endurance ($t=3.44$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance and in case of agility ($t=2.25$), explosive strength ($t=2.67$) which were greater than tabulated of 2.05 at 0.05 level of significance. Whereas no significant difference were found in speed, arm and shoulder strength, abdominal strength, explosive strength, endurance and flexibility.

Significant difference were found between the junior and senior female boxers of Rajasthan for physical variables in relation to agility ($t=2.87$), explosive strength (8.34) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance. Whereas no significant difference were found in speed, arm and shoulder strength, abdominal strength, endurance and flexibility.

Significant difference were found between the junior and senior female boxers of Delhi for physiological variables in relation to positive breath holding capacity ($t=2.87$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance. Whereas no significant difference were found in resting heart rate, systolic blood pressure and diastolic blood pressure.
Significant difference were found between the junior and senior female boxers of Haryana for physiological variables in relation to positive breath holding capacity ($t=4.05$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance. Whereas no significant difference were found in resting heart rate, systolic blood pressure and diastolic blood pressure.

Significant difference were found between the junior and senior female boxers of Punjab for physiological variables in relation to positive breath holding capacity ($t=3.00$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance. Whereas no significant difference were found in resting heart rate, systolic blood pressure and diastolic blood pressure.

Significant difference were found between the junior and senior female boxers of Rajasthan for physiological variables in relation to positive breath holding capacity ($t=2.84$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance. Whereas no significant difference were found in resting heart rate, systolic blood pressure and diastolic blood pressure.

Significant difference were found between the junior and senior female boxers of Uttarakhand for physiological variables in relation to positive breath holding capacity ($t=3.48$) which was greater than tabulated ‘$t$’ value of 2.76 at 0.01 level of significance and in case of systolic blood pressure ($t=0.09$) which were greater than tabulated of 2.05 at 0.05 level of significance. Whereas no significant difference were found in resting heart rate and diastolic blood pressure.

The analysis exhibits that the junior female boxers among the different states differed significantly for physical fitness variables like abdominal strength, explosive strength and endurance. The calculated ‘$f$’ ratio for abdominal strength (3.74), explosive strength (5.07), endurance (8.45) which were greater than the tabulated ‘$f$’ value of 3.60 at 0.01 level of significance. Whereas other physical fitness variables were not significant. The calculated ‘$f$’ ratio for speed (1.62), agility (0.87), arm strength (2.21), flexibility was 1.72 which was less than tabulated ‘$f$’ value 2.50 at 0.05 level.

Similarly significant findings were observed among the senior female boxers of northern Indian states in respect of abdominal strength and flexibility. The calculated ‘$f$’ ratio for abdominal strength (2.96) and flexibility (3.04) which were greater than the tabulated ‘$f$’ value of 2.50 at 0.05 level of significance. Other
variables were not significant as the calculated ‘f' ratio for speed (0.66), agility (1.44), arm and shoulder strength (0.66), explosive strength (0.15) and endurance (2.05).

In the physiological variables positive breath holding capacity was significant among the junior female boxers of the northern Indian states. The calculated ‘f' ratio for breath holding capacity was 10.55, which was more than the tabulated ‘f' value of 3.60 at 0.01 level of significance. No one showed any significant change in resting heart rate (1.30), systolic B.P. (1.30), diastolic B.P (1.02) was less than tabulated ‘f' value 2.50 at 0.05 level of significance.

In the physiological variables breath holding capacity was significant among the senior female boxers of the northern Indian states. The calculated ‘f' ratio for positive breath holding capacity was 2.67 which was more than the tabulated ‘f' value of 2.50 at 0.05 level of significance. No one showed any significant change in resting heart rate (0.35) in systolic blood pressure (0.54) in diastolic blood pressure (0.17) which was less than tabulated ‘f' value 2.50 at 0.05 level of significance.

**RECOMMENDATIONS**

In the light of the conclusions drawn from the study it may be recommended that:

1. A study may be undertaken of the teams fully with Indian boxers (male and female) of different age groups.
2. A similar study may be carried out with other relevant parameters of sports not used in this study.
3. A similar study may be undertaken with respect to different female sports.
4. A separate test battery may be used for selection of players for a particular sport.
5. Similar tests can be performed and interpreted every month.
6. Such studies may be conducted on other games also.
7. Similar study may be conducted to compare the boxer of different zones of country.
8. India is a vast country both from geographical as well as genetic lineage point of view. Therefore, to exploit the potential of the masses, sport research should be conducted in different climatic regions and on populations of different genetic origins.

In the last it's suggested that more emphasis should be given on the improvement of agility and flexibility of senior female boxers whereas more work should be done to improve other physical fitness variables and positive breath holding capacity of junior female boxers so that better result could be obtained from both the categories.