Thesis Title Study on Correlation between Physical Characteristics and Maximum Kicking and Punching Forces in Thai Boxers.

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ABSTRACT

To study the relation between physical characteristics and the maximum kicking and punching forces in Thai boxers (TB), a group of soccer players (SC) and of volleyball players (VB) were included for comparison as a group of non-athletes (NA) acted as control. Fifty subjects were selected according to the types of sports they participated and no difference in age. They were right-handed. Physical characteristics including body weight, body height, leg volume, leg muscle strengths, flexibility, anaerobic power and maximum oxygen consumption capacity (VO_2 max) were determined. Kicking force was performed at the target level of 60, 100 and 130 cm whereas punching force was performed in straight direction at shoulder level.

The results showed that TB exhibited the greater in both the right and the left kicking forces than SC and NA at each target level, and also the higher right and left punching forces than VB and NA. In the TB,the kicking force performed by either side of the legs at the target level of 100 cm was higher than that other levels whereas kicking force of the SC at the target level 130 cm was lower than and different from that at target level of 60 and 100 cm. In the NA, the left kicking force at the target level of 130 cm was lowest and different from that at other levels. Comparing between the right and the left kicking forces in any subject groups at each target level , it found that there were some differences between that at the target level of 60 cm in TB , at the 130 cm in SC and at the 100 cm and 130 cm in NA.

The positive correlation between kicking force at various target levels and physical characteristics of overall subjects was analyzed. It was found that both the right and the left kicking forces at the target levels of 60 and 100 cm were correlated with leg volume, lean leg volume and flexibility. At the target level of 130 cm, the right kicking force was correlated with leg volume and lean leg volume whereas the left kicking force was only correlated with flexibility. In addition, no correlation was found between the right or the left kicking force and the leg muscle strength, anaerobic power and maximum oxygen consumption capacity.

By considering each group of subjects, it was shown that in TB the right kicking force at the target level of 60 cm was correlated with body weight, leg volume, lean leg volume, and flexibility whereas the left kicking force was not; and their right kicking force at target level of 100 cm was correlated with body weight, lean body weight, and body height whereas the left kicking force was correlated with body weight and body height. In SC at the target level 60 cm , the correlation were found between the right kicking forces and body weight, leg volume, and lean leg volume whereas the left kicking force was not. The right kicking force at target level of 100 cm was correlated with body weight, lean body weight, leg volume and lean leg volume whereas the left kicking force was not correlated to any parameters. At the target level of 130 cm , neither the right nor the left kicking force in any subject groups showed correlation with any measured physical fitness and anthropometric parameters.

There was no significant difference between the right and the left punching force in any subject groups. The right and the left punching force of TB were correlated with body weight and lean body weight whereas the right punching force of the VB was found to be correlated with body weight,lean body weight and handgrip strength. In the NA, no correlations between punching force an all the measured parameters was found. Comparing the maximum kicking force and the maximum punching force,there was correlation in TB but was not in NA.

The results of the present study suggested that not only physical characteristics in relation to the maximum kicking and punching forces, there should be other factors determining the forces, including pattern of movement or biomechanical factors which not analyzed in this study. Good pattern of movement can increase movement ability , such as speed or velocity. However,the data from this study may be useful to develop ideas for possible future investigation in other interesting parameters or in any Thai boxing's techniques.