Journal of Exercise Science & Physiotherapy, Vol. 12, No. 2, 2016
ISSN: 0973-2020 (Print) *ISSN: 2454-6089 (Online)*

A Study of Physical Fitness Profile of Male Gatka Players

Sukhjinder Singh and Ashok Kumar

Abstract

Aim: The aim of the present study was to observe physical fitness profile of male gatka players.**Method:** Twenty seven (N=27) healthy trained male gatka players between the ages of 9 and 27 years volunteered for this study. Each participant was performed a vertical jump test, 505 agility test, a maximal right & left handgrip strength test, queen's step test (VO_2max) and flexibility measured at hip with goniometry (right & left hip flexion).**Result:** The mean age, height and weight of gatka players was 16.52±4.91year, 150.56±14.40cm and 43.00±12.01Kg. It was found that the scores of vertical jump test, 505 agility test, maximal right & left handgrip strength test, VO_2max, right & left hip flexion was 14.66±4.16cm, 2.91±0.35 second, 54.00±33.66 kg , 46.66±26.85 kg, 54.64±5.00 ml.kg.min^{-1}, 121.33±3.73 degree and 119.74±3.35 degree. **Conclusion:** It was concluded that the scores of right handgrip strength and right hip flexion were more than the left handgrip strength and left hip flexion and this may be due to the effect of dominant (right) and non-dominant (left) side of gatka players.

Sukhjinder Singh
Student of M.Sc. Sports Science, Department of Sports Science, Punjabi University Patiala (Punjab) India
Ashok Kumar
Associate Professor, Department of Sports Science, Punjabi University Patiala (Punjab) India
Email: akashokin@gmail.com

Key Words: Agility, Flexibility, Handgrip strength, VO_2max, Vertical jump

DOI: 10.18376/jesp/2016/v12/i2/111264

Introduction

Physical fitness is the ability of the body to function at optimal efficiency. Physical fitness involves skill-related (Speed, Power, Agility, Balance, Reaction time, Coordination) and health-related components (Cardiorespiratory endurance, Muscular strength, Muscular endurance, Flexibility, Body composition). The *skill-related* components of fitness are important to athletic success and are not crucial for health. The *health-related* components of fitness are important for health and performance of daily functional activities (Astrand 2000). Gatka is a martial art from the North of India practiced by the Sikhs. Gatka is a style of stick fighting, with wooden sticks intended to simulate swords. By conception, gatka is defensive as well as offensive and focuses on infusing the physical with both the spiritual and mental. The style originated in later 19th century, out of sword practice in the British Indian Army, divided in two sub-style, called rasmi (ritualistic) and khel (sport) from the 1880s. From a physical conditioning perspective, the goal of gatka training is to prepare competitors to effectively manage

both the physical activity and the physiological demands of combat. In championship, competitors perform long periods of fighting activity interposed with brief periods of non-fighting activity (pause, 30 second). These contests may elicit near maximal heart rate (HR) responses and high lactate concentrations, which infer that high demands may be imposed upon both aerobic and anaerobic metabolism during the bouts. The physical activity and physiological requirements of gatka competition require athletes to be competent in several aspects of fitness, including aerobic and anaerobic power, muscular strength, muscular power, flexibility, speed and agility. It is therefore important that coaches and sports scientists collect objective information about their players' physical performance capabilities to substantiate the objectives of training, establish short and long-term training programmes and provide objective feedback and to motivate athletes during training. Hence the present study was undertaken to observe the different components of physical fitness in trained male gatka players. The alpha level for the data analysis was determined at 0.05 levels.

Results and Discussion

The mean height and weight of gatka players was 150.56±14.40 cm and 43.00±12.01Kg. Their body mass index (BMI) was 18.48±2.36 (Table 1).

Table 1. Mean±SD of Anthropometric & Physical Fitness variables of Male Gatka Players

Variable(s)	Mean	Std. Deviation
Age, year	**16.52**	**4.91**
Height, cm	**150.56**	**14.40**
Weight, kg	**43.00**	**12.01**
BMI, kg/m^2	**18.48**	**2.36**
Leg Power		
Vertical Jump Height, cm	**14.66**	**4.16**
Muscular Fitness		
Handgrip Strength Right, kg	**54.00**	**33.66**
Handgrip Strength Left, kg	**46.66**	**26.85**
Agility		
Agility 505 test (AG505),second	**2.91**	**0.35**
Cardiorespiratory Fitness		
VO_2max,ml.kg.min^{-1}	**54.64**	**5.00**
Flexibility (with Goniometry)		
Hip Flexion (HFR), degree	**121.33**	**3.73**
Hip Flexion (HFL), degree	**119.74**	**3.35**

The right and left handgrip strength of gatka players was 54.00±33.66kg and 46.66±26.85kg. It was found that the absolute and percent difference in the value of right and left handgrip strength was 7.34kg and 13.59 % (Table 18). Thus, mean value of right handgrip strength was more than left handgrip strength. This may be due to the effect of dominant (right) and non-dominant (left) hand of the subjects. Further, it was found that the mean difference between right and left handgrip strength was statistical significant (t=3.916 p≤ .01) (Table 2).

Table 2. Paired T-test of right and left handgrip strength of gatka players

	Paired Differences				
	Mean Difference	95% Confidence Interval of the Difference		t	Sig. (2-tailed)
		Lower	Upper		
Right handgrip strength - Left hand grip strength	7.33333	3.48388	11.18279	3.916	.001

The vertical jump height of gatka players was 14.66±4.16cm (Table 1). A heavier person jumping the same height as a lighter person has to do more work as they have a larger mass to move. It is sometimes useful to convert the vertical jump height to units of power. Power cannot be calculated (Power = Work ÷ Time) since the Time the force is acted on the body is unknown. Formulas have been developed that estimate power from vertical jump measurements. In these formulas mass = body weight and VJ = Vertical Jump height.

Johnson and Bahamonde (1996) established equations for peak and average power.

- Peak power (W) = 78.5 x VJ (cm) + 60.6 x mass (kg) -15.3 x height (cm) - 1308
- Average power (W) = 41.4 x VJ (cm) + 31.2 x mass (kg) -13.9 x height (cm) + 431

Thus, in the present study an estimated average power was 49 watts and peak power was 134 watts of gatka players.
The agility test (505 agility test) score of gatka players was 2.91±0.35 second. On the basis of the time taken for 505 agility test, an estimated subject's speed was 11.24 feet/sec or 7.67mphbor3.43 m/sec or 12.34 km/hr.
An estimated VO_2max (Queen's college step test) of gatka players was 54.64±5.00 ml.kg.min^{-1}
The right and left hip flexion of gatka players was 121.33±3.73° and 119.74±3.35° and was in the normal range (Table1). The mean value of right hip flexion was more than left hip flexion. Further, it was found that the mean difference between right and left hip flexion was statistical significant (t=5.937 p≤ .01) (Table 3).

Table 3. Paired T-test of Right and Left Hip Flexion of Gatka Players

	Paired Differences				
	Mean Difference	95% Confidence Interval of the Difference		t	Sig. (2-tailed)
		Lower	Upper		
Right hip flexion–Left hip flexion	1.59259	1.04118	2.14401	5.937	.000

Conclusion

It was concluded that the scores of right handgrip strength and right hip flexion were more than the left handgrip strength and left hip flexion and this may be due to the effect of dominant (right) and non-dominant (left) side of gatka players.

Acknowledgment

The authors thank all the subjects who voluntarily participated in this study.

References

Astrand, P.O.2000. Endurance Sports. In Endurance in Sport: Volume II of the Encyclopedia of Sports Medicine an IOC Medical Commission Publication In Collaboration with the International Federation of Sports Medicine. Eds R.J. Shephard and P.-O. Astrand, Second Edition, *Blackwell Science*. pp 9-15. ISBN 0-632-05348-8.

Johnson, Doug L and Bahamonde, Rafael.1996. Power Output Estimate in University Athletes. Journal of Strength & Conditioning Research, 10 (3),161-166.

Conflict of Interest: None Declared