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Athlete mindful skills associated with reaction time among recreational football players: An analytical study

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Abstract

To examine the association between mindful skills and reaction time on sports performance among recreational football players. An observational analytical study was conducted at different sports academy in Ahmedabad using purposive sampling. 69 football players age between 10-16 years old, minimum playing football as last 2 years and 8-10 hours per week were included. Each individual performed mindfulness inventory for sport was taken to assess the athlete mindful skills and reaction drop test to assess the reaction time. Spearman correlation was used between mindfulness inventory for sport and reaction drop test. Moderate negative association between mindful skill and reaction time in recreational football players ($r=-0.596$, $p<0.05$). Present study concluded that higher mindful skills suggesting fast reaction time in recreational football players. That is helpful for the adolescents while playing football as well as increased playing capacity and also can be prevent injury and become more resilient against potential damage in the players.

Keywords: Football players, mindful skills, reaction time

Introduction

These days Sports Science has become a vital part to make an athlete or any researcher successful in all fields of sports and games. In India, sport scientists are also trying their level best through the scientific training to push athletes to their level best performance ^[1].

Mindfulness can be defined as the cognitive procedure of intentionally maintaining attention in the present moment, with no judgment to the experience and expectations to what happens next ^[2]. Bishop SR, *et al.* suggested a two-component model of mindfulness: (a) Self-regulation of attention entails maintaining attention in the immediate experience, whereas (b) orienting of attention that involves experience with the orientation of curiosity, openness, and acceptance ^[3]. A recent advance in sports science suggests that mindfulness meditation may have a positive effect on performance ^[4].

Reaction time is the interval between the onset of a signal (stimulus) and the initiation of a movement response. Reaction time can be broken down into three parts. The first is perception time: the time for the application and perception of the stimulus and giving the necessary reaction to it. The second is decision time, which signifies the time for giving an appropriate response to the stimulus. The third is motor time, which is the time for compliance to the order received. Singer, *et al.* defined reaction time as being composed of four stages, namely: the start of eye movements, eye movement time, decision time and muscle contraction time. Reaction time is affected by factors such as age, gender, number of simultaneous stimuli, nutrition, physical activity, training and physical fitness and fatigue ^[5]. It is known that athletes have better reaction times than non-athletes. Reaction time is a decisive factor affecting success in sporting competitions. The reaction times of athletes in different sports show variations ^[6].

To examine the association between mindful skills and reaction time on sports performance among recreational football players. There has been less attention, to mindful skills and sports performance within an adolescent population. Mindful skills and reaction time while have been important factors in the area of sports with a focus on improved performance across recreational populations.

Methods

Observational analytical study conducted at Different sports academy of Ahmedabad with purposive sampling. Study duration was September 2023 to December 2023. A sample size was estimated on the basis of pilot study and the sample size obtained was 120. $N = \frac{Z\alpha + Z\beta}{C^2}$, Where; $C = 0.5 \times \frac{(1+r)}{(1-r)}$ r = correlation coefficient.

Age between 10-16 years old, minimum playing football for 2 years, playing football minimum 8-10 hours per week were included in present study. History of fall in last month, any surgery performed by last 3 months, Diagnosis with psychometric disorders and upper limb injury due to which reaction drop test cannot be performed were excluded in present study.

The study was conducted according to the ethical principles of the Declaration of Helsinki and there was no risk to the participant. Total 90 football players' individuals were screened, out of which 12 individuals did not match the inclusion criteria and 9 were not interested in this study. It is a cross-sectional study conducted with 69 football players who had participated in different sports academy Ahmedabad, India. Convenience sampling was adopted for the selection of individuals for the study. Individual's players and those parents were explained about the study. Consent was taken from those willing to participate and fulfilling inclusion and exclusion criteria were included in the study. Written informed consent was taken from parents. Each individual performed reaction drop test to assess the reaction time and mindfulness sport inventory was taken to assess the athlete mindful skills. Data was analysed.

Outcome measure

1. Reaction drop test: Assess the reaction time

The person to be tested stands or sits near the edge of a table, resting their elbow on the table so that their wrist extends over the side. The assessor holds the ruler vertically in the air between the participant's thumb and index finger, but not touching. Align the zero mark on the ruler with the participant's fingers. The participant should indicate when they are ready. Then, without prior warning, the assessor releases the ruler and lets it drop - the subject must catch it as quickly as possible as soon as they see it fall. Record in centimetres the distance the ruler fell (the level the participant grabs the ruler). Repeat this procedure 3 times and take the average score [7].

2. MIS (Mindfulness Inventory for Sport): Assess the athlete mindful skills

The Mindfulness Inventory for Sport (MIS) was devised using a three-stage approach, to measure one's ability to: (1) be aware of disruptive stimuli and their associated internal reactions; (2) adopt a non-judgmental attitude towards these stimuli and reactions; and (3) quickly refocus attention on goal-related cues [8]. A 6-point Likert scale (1 = not at all; 6 = very much) was used to indicate how much each statement reflects the participants experience following the instructions: "the statement below describes a number of things that athletes may experience just before or during sport performance. Circle the number that best indicates how much each statement is generally reflective of your recent experience [9].

Statistical Analysis

Data analysis was done using SPSS version 20 and Microsoft excel 2007. Prior to statistical tests, the data was screened for

normality. Sample size was >50 in Kolmogorov Smirnov (KS) test was used to check normality. Spearman association was used between mindfulness inventory for sport and reaction drop test. Level of significance was kept at 5% ($p < 0.05$).

Result

Total 69 participants, completed the study. Mean age of participants was 12.58 ± 2.59 years. Mean BMI of participants was 18.37 ± 5.22 kg / cm².

Table 1: Association between mindfulness skills and Reaction time among football players

Outcome measures	r - value	p - value
Mindfulness sport inventory and Reaction drop test	-0.596	<0.001

Discussion

The objectives of present study to find association between mindfulness inventory for sport and reaction drop test among recreational football player.

In present study moderate negative association between mindful skills associated with reaction time in recreational football players ($r = -0.596$, $p < 0.05$). Similar study findings by Worthen D, *et al.* concluded that correlation between mindfulness, attention and reacted to quick during professional volleyball players. No study found in football players [6]. Butola R, *et al.* found that attention, memory and reaction time are associated to each other in normal individuals and also they suggest that two weeks meditation training enhance the ability to sustain attention, short term memory and reaction time on normal individuals [10]. Limitation of present study were multivariate analysis was not done.

Conclusion

Present study concluded that higher mindful skills suggesting fast reaction time in recreational football players. That is helpful for the adolescents while playing football as well as increased playing capacity and also can be prevent injury and become more resilient against potential damage in the players. Mindful skills intervention programmed in the curriculum may be a feasible approach to improve reaction time and performance level in recreational football players.

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