**STAR**
Research Journal

*Available online at www.starresearchjournal.com (Star International Journal)*

**PHYSICAL EDUCATION**

*Star. Phy. Edn. 01 (2013)*

# INFLUENCE OF FUNCTIONAL TRAINING WITH AND WITHOUT VISION TRAINING ON SELECTED SKILL RELATED PHYSICAL FITNESS COMPONENTS AND PERFORMANCE VARIABLES AMONG INTERCOLLEGIATE MEN FIELD HOCKEY PLAYERS.

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**ARTICLE INFO**

**Article history:**
Received: 03.09.2013
Received in revised form: 20.09.2013
Accepted: 28.09.2013

**Keywords**
Functional training,
Vision training

**ABSTRACT**

The purpose of the study was to find out the influence of functional training with and without vision training on selected skill related physical fitness components and performance variables namely speed, muscular power, coordination, shooting accuracy among intercollegiate men field hockey players. To achieve the purpose of the study, forty five male hockey players were randomly selected from three colleges namely, Vidyasagar college of Arts and Science, Udumalpet, Mahalingam college of Engineering and Technology, Pollachi, and Nachimuthu Politechnic College, Pollachi were selected. The age of the subjects selected for this study was between 18 and 25 years. The subjects had past experience of at least three years in hockey and only who those represented their respective college teams were taken as subjects. A series of physical fitness tests was carried out on each participant. These included speed assessed by 50 mts dash, muscular power assessed by standing broad jump, coordination assessed by wall toss test and Performance variable such as shooting accuracy was measured by Harbindhar Singh Shooting Accuracy Test. By using the matching procedure on the basis of their initial hockey playing ability performance test scores, The subjects were randomly assigned into three groups of fifteen each, such as experimental and control groups. Group-I underwent functional training without vision training, Group-II underwent functional training with vision training and Group-III acted as control group. The experimental group participated in the functional training with and without vision training for 3 days a week, one session per day and for 8 weeks each session lasted 90 minutes. The control group maintained their daily routine activities and no special training was given. The subjects of the three groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. In case 'F' values found to be the significant the Scheffe's test was used as post hoc test. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups. The results of the study showed that there was significant level differences exist between functional training with vision training and control group and functional training without vision training and control group.



## Introduction

Functional training is designed to specifically enhance the performance of activities of daily living, recreational pursuits, and sports performance. It targets the neuromuscular system and trains movements (muscle groups and the nervous system) **(Boyle, 2004)**. Functional training programs have been used in a variety of rehabilitation settings with documented success. Based on that success, the concept of functional training has gained popularity in applied fitness settings to enhance sport performance **(Thompson, Cobb and Blackwell, 2007)**. Functional training is designed to improve stability and mobility through specific movement patterns. It is believed this type of training will provide a better foundation of neuromuscular input to improve the efficiency of the kinetic linking system **(Gambetta & Clark, 1998; Hedrick, 2000; Voight & Cook, 2001).** Vision is one of the several sensory organs which receive information from the external environment and for years it has been recognized that many sports place demands on vision and particular visual skills. The earliest proponent of this concept was Galen, a Roman Physician who in the second century believed that there is a relationship between ball sports, body and visual status **(Hitzeman & Beckerman, 1993)**. In spite of this early recognition of visual importance in sports it stood neglected for many years and it was not before the middle of 20th century that new scientific opinions were developed and the thought, "sports being a multidisciplinary approach" came into picture **(Jafarzadehpur & Yarigholi, 2004).** Sports Vision as such includes specific visual determinants which precisely coordinates a player's activity during the game. It has been seen that successful athletes generally have better skill, accuracy and spatio-temporal constraints on visual information acquisition. As such if two similar athletes meet in competition and one has a better trained visual system, the athlete with enhanced visual system will perform better **(Loran & Griffiths, 2001).**

The researcher is a Hockey players, official, coach, administrator, selector, observer attempted to study about the functional and vision training of the Hockey players. Functional & vision training can help to improve performance in hockey players. Little research has been done on hockey players.

The purpose of the study was to find out the influence of functional training with and without vision training on selected skill related fitness and performance related variables among intercollegiate men field hockey players.

## Materials and Methods

To achieve the purpose of the study, forty five male hockey players have been randomly selected from three colleges namely, Vidyasagar college of Arts and Science, Udumalpet, Mahalingam college of Engineering and Technology, Pollachi, and Nachimuthu Politechnic College, Pollachi were selected. The age

of the subjects selected for this study was between 18 and 25 years. The subjects had past experience of at least three years in hockey and only who those represented their respective college teams were taken as subjects. A series of physical fitness tests was carried out on each participant. These included speed assessed by 50 mts dash, muscular power assessed by standing broad jump, coordination assessed by wall toss test and Performance variable such as shooting accuracy was measured by Harbindhar Singh Shooting Accuracy Test. By using the matching procedure on the basis of their initial hockey playing ability performance test scores, The subjects were randomly assigned into three groups of fifteen each, such as experimental and control groups. Group-I underwent functional training without vision training, Group-II underwent functional training with vision training and Group-III acted as control group. The experimental group participated in the functional training with and without vision training for 3 days a week, one session per day and for 8 weeks each session lasted 90 minutes. The control group maintained their daily routine activities and no special training was given. The subjects of the three groups were tested on selected variables prior and immediately after the training period. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. In case 'F' values found to be the significant the Scheffe's test was used as post hoc test. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups.

**TABLE-I**
**Criterion measures**

| S.No | Criterion measure | Test items | Unit of measurement |
|---|---|---|---|
| 1 | Speed | 50 meter dash | In Seconds |
| 2 | Muscular power | Standing Broad Jump test | In meters |
| 3 | Coordination | Wall Toss test | In Score |
| 4 | Shooting accuracy | Harbindhar Singh Shooting Accuracy Test | In Score |

**TABLE – II**
**Descriptive analysis of selected skill related physical components & performance variables among control and experimental groups**

| S.No | Variables | Group | Pre-Test Mean | SD (±) | Post – Test Mean | SD (±) | Adjusted Mean |
|---|---|---|---|---|---|---|---|
| 1 | Speed | CG | 7.28 | 0.27 | 7.28 | 0.25 | 7.28 |
| | | FT | 7.25 | 0.27 | 6.75 | 0.21 | 6.76 |
| | | FWVT | 7.26 | 0.06 | 6.77 | 0.31 | 6.77 |
| 2 | Muscular power | CG | 2.26 | 0.03 | 2.26 | 0.03 | 2.26 |
| | | FT | 2.25 | 0.02 | 2.36 | 0.02 | 2.37 |
| | | FWVT | 2.25 | 0.03 | 2.37 | 0.02 | 2.37 |
| 3 | Coordination | CG | 27.13 | 2.35 | 27.40 | 1.59 | 27.54 |
| | | FT | 27.00 | 2.69 | 33.13 | 1.99 | 33.34 |
| | | FWVT | 28.00 | 2.87 | 33.20 | 2.56 | 32.85 |
| 4 | Shooting accuracy | CG | 11.66 | 2.09 | 11.86 | 1.59 | 11.93 |
| | | FT | 11.86 | 2.38 | 15.26 | 2.12 | 15.19 |
| | | FWVT | 11.73 | 1.70 | 17.86 | 1.92 | 17.88 |

**CG= Control FWVT= Functional with vision training group FT= Functional training group**

The tables-II the pre, post-test means, standard deviations and adjusted means on selected skill physical fitness components and performance variables of hockey players were numerical presented. The analysis of covariance on selected variables of Functional training, Functional training with vision training and control group is presented in table – III

**TABLE – III**
**Computation of analysis of covariance selected skill related physical components & performance variable variables among Hockey players**

| S.No | variables | Test | Sum of variance | Sum of squares | df | Mean square | F ratio |
|---|---|---|---|---|---|---|---|
| 1 | Speed | Pre-test | B.W | 0.01 | 2 | 0.003 | 0.03 |
| | | | W.G | 3.45 | 42 | 0.08 | |
| | | Post-test | B.W | 2.74 | 2 | 1.37 | 27.11* |
| | | | W.G | 2.12 | 42 | 0.05 | |
| | | Adjusted means | B.S | 2.59 | 2 | 1.30 | 116.40* |
| | | | W.S | 0.457 | 41 | 0.01 | |
| 2 | Muscular power | Pre-test | B.W | 0.00 | 2 | 0.000 | 0.42 |
| | | | W.G | 0.04 | 42 | 0.00 | |
| | | Post-test | B.W | 0.10 | 2 | 0.05 | 66.41* |
| | | | W.G | 0.03 | 42 | 0.00 | |
| | | Adjusted means | B.S | 0.11 | 2 | 0.05 | 104.57* |
| | | | W.S | 0.021 | 41 | 0.00 | |
| 3 | Coordination | Pre-test | B.W | 8.84 | 2 | 4.422 | 0.63 |
| | | | W.G | 295.73 | 42 | 7.04 | |
| | | Post-test | B.W | 332.58 | 2 | 166.29 | 38.01* |
| | | | W.G | 183.73 | 42 | 4.37 | |
| | | Adjusted means | B.S | 310.24 | 2 | 155.12 | 69.54* |
| | | | W.S | 91.451 | 41 | 2.23 | |
| 4 | Shooting accuracy | Pre-test | B.W | 0.31 | 2 | 0.156 | 0.04 |
| | | | W.G | 182.00 | 42 | 4.33 | |
| | | Post-test | B.W | 271.60 | 2 | 135.80 | 37.92* |
| | | | W.G | 150.40 | 42 | 3.58 | |
| | | Adjusted means | B.S | 266.41 | 2 | 133.20 | 98.17* |
| | | | W.S | 55.628 | 41 | 1.36 | |

*Significant at 0.05level of confidences

(Table value for df 2 and 42 was 3.22, Table value for df 2 and 41 was 3.23)

In the table II, the results of analysis of covariance on speed, muscular power, coordination and shooting accuracy are

given. The obtained 'F' ratio of 0.03, 0.42, 0.63 and 0.04 for Pre-test means was less than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on speed, muscular power, coordination and shooting accuracy. The obtained 'F' ratio of 27.11, 66.41, 38.01 and 37.92 for post-test means was greater than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on speed, muscular power, coordination and shooting accuracy. The obtained 'F' ratio of 116.40, 104.57, 69.54 and 98.17 for adjusted post-test means was greater than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on speed, muscular power, coordination and shooting accuracy. The result of the study indicated that there was a significant difference among the adjusted post test means of functional training group and functional with vision training group and control group on speed, muscular power, coordination and shooting accuracy..

Since the obtained 'F' ratio value was significant further to find out the pair mean difference, the scheffe's test was employed and presented in table-IV

**TABLE – IV**

**The Scheffe's test for the differences between the adjusted Post tests paired means on speed, muscular power, coordination and shooting accuracy.**

| Functional with vision training | Functional training | Control group | Mean difference | Confidence Interval |
|---|---|---|---|---|
| **Speed** | | | | |
| 6.77 | 6.76 | ….. | 0.01 | 0.10 |
| 6.77 | ….. | 7.28 | 0.50* | 0.10 |
| ….. | 6.76 | 7.28 | 0.51* | 0.10 |
| **Muscular power** | | | | |
| 2.37 | 2.37 | ….. | 0.01 | 0.02 |
| 2.37 | ….. | 2.26 | 0.11* | 0.02 |
| ….. | 2.37 | 2.26 | 0.10* | 0.02 |
| **Coordination** | | | | |
| 32.85 | 33.34 | ….. | 0.49 | 1.36 |
| 32.85 | ….. | 27.54 | 5.32* | 1.36 |
| ….. | 33.34 | 27.54 | 5.81* | 1.36 |
| **Shooting accuracy** | | | | |
| 17.88 | 15.19 | ….. | 2.70* | 1.06 |
| 17.88 | ….. | 11.93 | 5.95* | 1.06 |
| ….. | 15.19 | 11.93 | 3.26* | 1.06 |

*Significant at 0.05level of confidences

From the table-IV, it is clear that the adjusted post test means of speed are 6.77, 6.76 and 7.28 respectively. The mean differences values on speed between functional training with vision training group and control group & functional training without vision training group and control group are 0.50 and 0.51 respectively which are greater than the confidence interval value 0.10 at 0.05 level of confidence. The results of the study showed that there were a significant difference between functional training with vision training group and control group & functional without vision training group and control group. There was no significant difference between experimental group I and II on speed since the mean difference 0.01 was lesser than the confidence interval 0.10 at 0.05 level.

From the table - IV, it is clear that the adjusted post test means of muscular power are 2.37, 2.27 and 2.26 respectively. The mean differences values on muscle power between functional training with vision training group and control group & functional training without vision training group and control group are 0.11 and 0.10 respectively which are greater than the confidence interval value 0.02 at 0.05 level of confidence. The results of the study showed that there were a significant difference between functional training with vision training group and control group & functional without vision training group and control group. There was no significant difference between experimental group I and II on speed since the mean difference 0.01 was lesser than the confidence interval 0.02 at 0.05 level.

From the table - IV, it is clear that the adjusted post test means of coordination are 32.85, 33.34 and 27.54 respectively. The mean differences values on coordination between functional training with vision training group and control group & functional training without vision training group and control group are 5.32 and 5.81 respectively which are greater than the confidence interval value 1.36 at 0.05 level of confidence. The results of the study showed that there were a significant difference between functional training with vision training group and control group & functional without vision training group and control group. There was no significant difference between experimental group I and II on speed since the mean difference 0.49 was lesser than the confidence interval 1.36 at 0.05 level.

From the table-IV, it is clear that the adjusted post test means of shooting accuracy are 17.88, 15.19 and 11.93 respectively. The mean differences values between functional training with vision training group and functional training without vision training group functional training with vision training group and control group & functional training without vision training group and control group are 2.70, 5.95 and 3.26 respectively which are greater than the confidence interval value 1.06 at 0.05 level of confidence. The results of the study showed that there were a significant difference between functional training with vision training group and functional training without vision training group functional training with vision training group and control group & functional without vision training group and control group. There was a significant difference between experimental group I and II on speed since the mean difference 2.70 was greater than the confidence interval 1.06 at 0.05 level.

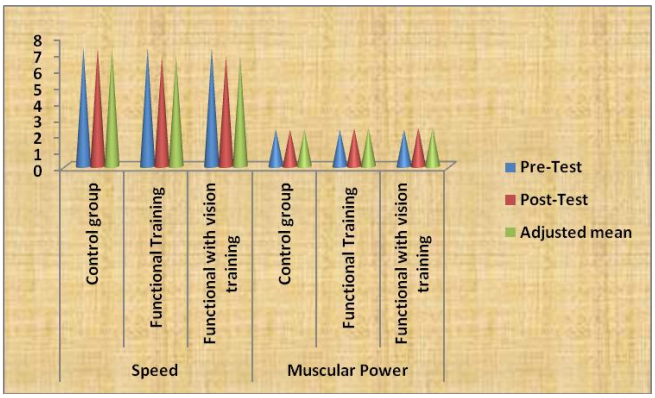


**Figure-I** The pre, post and adjusted mean values of speed and muscular power of control group, functional training and functional training with vision training group are graphically represented in the figure-I

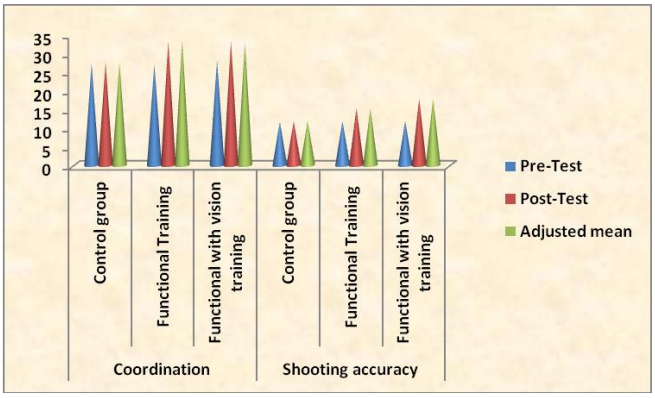

**Figure-II** The pre, post and adjusted mean values of coordination and shooting accuracy of control group, functional training and functional training with vision training group are graphically represented in the figure-II

**Discussion of findings**

The results of the study indicate that the experimental group which underwent functional training with vision training showed significant improvement in the selected variables namely speed, muscular power, coordination and shooting accuracy, when compared to the control group. Functional training with and without vision training showed significant improvement in the selected variables namely speed, muscular power, coordination and shooting accuracy, when compared to the control group. When experimental groups were compared functional training with vision training group showed significant improvement in shooting accuracy than functional training without vision training. The past studies on selected physical variables also reveals similar result Gambetta and Gray (2002), Quevedo et al. (1999) & Revien & Gabor (1981) Found that functional training with vision training group showed significant improvement on speed, muscular power and coordination compared to control group

**Conclusions**

From the analysis of data, the following conclusions were drawn.

1. The functional training with and without vision training had significant improvement on the selected skill related fitness components namely speed, muscular power, coordination and performance variable namely, shooting accuracy among intercollegiate men field hockey players.
2. The functional training with vision training had significantly better improvement than the functional training with vision training on the selected performance variable namely shooting accuracy among intercollegiate men field hockey players.
3. There was no significant difference between functional training with vision training and functional training without vision training on the selected skill related fitness components namely speed, muscular power, and coordination among intercollegiate men field hockey players.

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