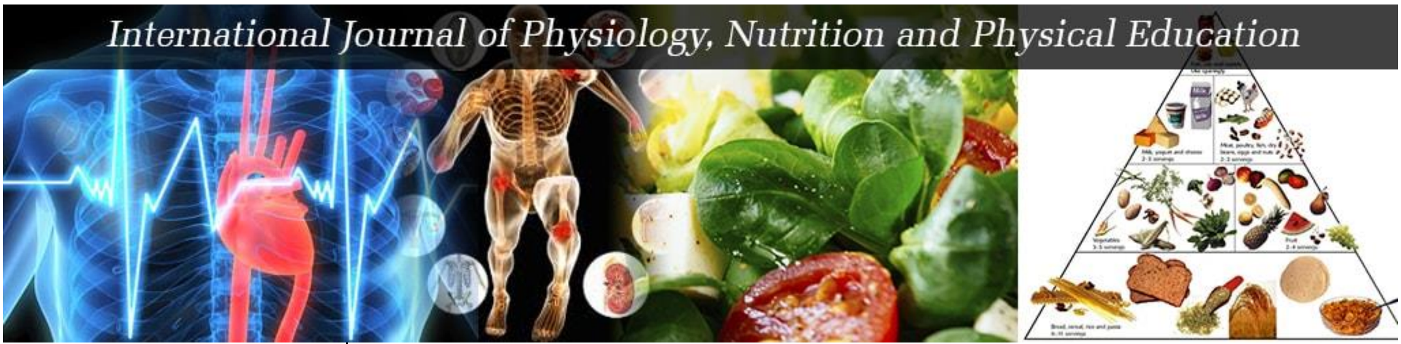

ISSN: 2456-0057
IJPNPE 2023; 8(1): 75-78

www.journalofsports.com
Received: 01-10-2022
Accepted: 06-11-2022

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Effect of six week coordinative drills on eye hand coordination of young Athletes

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DOI: https://doi.org/10.22271/journalofsport.2023.v8.i1b.2672

Abstract
The aim of the experiment was to explore the effect of 6- weeks coordination training on eye hand coordination of young athletes. Thirty samples (cricket players) included in the experiment and equally divided into two groups and their age ranged between 12-15 years with mean & SD 14.09±1.32 years, from LNIPE cricket nursery. To measure the Adaptive Spatial Ability of the cricket players a computerized having high validity and reliability Psychological Assessment tool through VTS version -6 was used for which no computer experience or any training is required. The Vienna Test System SPORT is perfectly designed for sports psychology assessment, which is a valid psychometric tool for analyzing profile of the young players /athletes and provides clear report of their sports psychology profile (Vienna Test System sports, 2017). For this trial, a pre- and post-test control group design was used. The training programme was conducted over the course of six weeks. All subjects were informed about the objective of the study and gave consent to be volunteer participants for the experiment. The training was carried out three times per week on alternate days for experimental group. The statistical method ANCOVA was used with an alpha level of 0.05 to examine the impact of a 6-week coordination training programme on eye-hand coordination. Inferring that 6-weeks of coordination training is helpful for enhancing young athletes' eye-hand coordination is possible after statistical analysis of the data indicated that there is a significant difference in eye-hand coordination as the f value was found significant ($p<.05$).

Keywords: Coordination training, Vienna test system, eye hand coordination, athlete, etc.

Introduction
Sport is conceived as a psychophysical phenomenon in modern times. When analyzing sports skills, almost all motor movements are supported by one or another psychological factor. Singer (1979) reported that activities that are mainly oriented to movement and the emphasis on physical responses are labeled "psychomotor". Noble (1968) has argued that motor skills can be defined as simple muscle actions modified by learning variables. There is no doubt that sports performance is based on cognitive and perceptive skills, as well as on motor and physical skills (Schwab and Memmert 2012) [9]. According to Kandel, Schwartz and Jessel (2000, 318), the main cognitive neural sciences include perception, action, emotion, motivation, language, learning and memory.

Co-ordinative abilities are one of the essential need for performing physical skills that allows a person to use the neuromuscular and kinesthetic senses of the parts of the body to perform the exercises successfully and accurately. Hand-eye/ foot -eye coordination are the abilities to perform activities that require the simultaneous use of hands and eyes, as an activity that uses the information I that I our I eyes I perceive (visual I spatial perception) to guide our hands to perform them. Hand-eye coordination is fundamental for many human activities (use of tools, food, sport and work, just to name a few) as a distinctive feature of typical human life. The normal coordination between the eyes and the hand involves the synergistic function of different sensomotor systems, including the visual system, the vestibular system, the proprioception and the eyes, the control systems of the head and arm, as well as the aspects of the attention and memory similar to cognition. This makes understanding the neural fundamentals of rather daunting hand-eye coordination, even if we consider that it is only the sum of its parts. However, hand-eye coordination is even more than this; It evokes combinatorial problems that do not arise when we study individual isolated components. However, in the end, the purpose of the "hand-eye" coordination system is direct: the use of vision to guide hand movements (reaching, grasping and manipulating). (Crawford, Medendorp and Marotta, 2004) [2]. Development of good coordination is a sequence of multiple levels that progresses from the skills performed with a good spatial awareness but without speed to the skills realized at increasing speeds and in a constantly evolving environment (Grasso, 2017) [3]. As Joseph Drabik points out, coordination develops better between the ages of 7 and 14, and the most crucial period is between 10 and 13 years.

Recent studies have supported the theory that coordinated training, when performed for the right duration at the right intensity, meets the criteria for the development of baseball, tennis, etc. Therefore, this study was an attempt to see the effects of coordination training on eye hand coordination (sensory motor coordination).

Methods

Subjects

To systematize the experiment, subjects were divided into two groups (experimental group and control group). A total of 30 males (15 players in each group) cricket players age ranged from 12-15 with mean & SD 14.09±1.32 years, from LNIPE cricket nursery, Gwalior (MP) selected as subjects for the study. The main aim of the research was explained to all the subjects and subjects were highly inspired to put their best during each trial.

Variables

- Independent Variable
  - 6- Weeks Coordination Training
- Dependent variable
  - Eye hand coordination

Criterion Measures

Eye hand coordination was measured through Vienna Test System (VTS). Measuring unit of scores was degree. The Vienna Test System is leading computerized psychological assessment tool. VTS ensures the highest possible level of objectivity and precision, including aspects that cannot be measured by traditional paper-and-pencil tests. The scoring of test results is fast and accurate.

Experimental Design

In the present experiment, Pre & Post test technique design was used to examine the effect of given treatment. By randomization method all samples were divided into two groups having 15 participants in each group and named them as experimental and control groups. The players of experimental group participated in six week NMS training program whereas Control group was given no such training during intervention training phase. The training sessions were planned with a set of specific drills with number of repetitions, sets and can be quantified the whole training session. This schedule continued for six weeks having three sessions per week of 45 minutes duration.

Administration of Training Programme

As per the protocol of the experiment training was imparted to the experimental group by the trainer and same is monitored by the researcher himself at the play field. Three days a week, for a total of six weeks, the training was conducted, excluding the time required to conduct pre- and post-tests. The researcher gave the training to experimental group. Each participant in the experimental group completed their designated training. Between the tests, the necessary and sufficient recovery was given. Each exercise's movement pattern was shown during the demonstration by the scholar. The control group was not permitted to participate in any such training programs on their own throughout the intervention phase. Training load progressively increased at the end of second and fourth week of training. Similarly, sets and time duration also increased.

Table 1: Experimental Protocol

Exercise	Week 1&2	Week 3&4	Week 5 &6
Warming up (in min)	3	3	3
Ball Drops Catches	30	2 x20	3x20
Alternate Hand Wall Drop Catch	30	2 x20	3x20
Mirror drill	30 sec	45 sec	60 sec
Push up and catch	15	2 x 10	2 x20
Skipping	30	50	70
Cool down(in min)	3	3	3

Administration of Test

- **Sensomotor Coordination**
- **Purpose:** To measure the senso-motor coordination (eye-hand coordination)
- **Test form:** S1 (Short form)
- **Testing duration:** 10 minutes
- **Sub Factors**

Mean score for the deviation from the correct angle (MAD)

This score is calculated for the duration of the test presentation. This value indicates how well the respondent was able to control and influence the tilting motion, regardless of the correct position.

The test administration consists of an instruction phase, a practice phase and the actual test phase. The task of manoeuvring a geometric figure (circular segment) was selected, as instructions on how to complete this task are easy to give and the respondent's performance is minimally influenced by any previous experience. A three-dimensional room s presented on the screen containing a goal (a green "T") and the object to be maneuvered (yellow circular segment). The circular segment stands on a point and begins to make three different types of movements n unpredictable directions (These remain the same for all respondents.): titling = turning from side to side; horizontal motion from side to side and a back and forth motion along the projected line of perspective with a corresponding change n the size of the segment. The respondent's task s to use joysticks and/or foot pedals simultaneously n such a way so that the circular segment stands upright touching the intersection of the green "T" and s the same size as the vertical green bar. The monitor should be set up at the same level as the Universal panel.

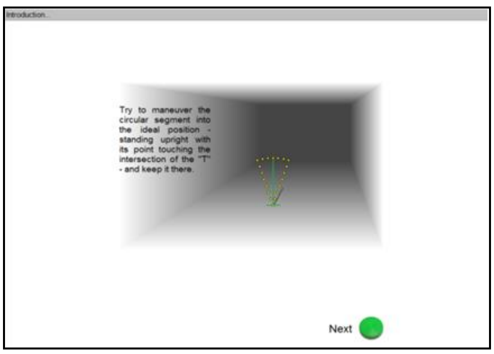

Fig 1: Eye Hand Coordination Test on Vienna Test System

Statistical Technique

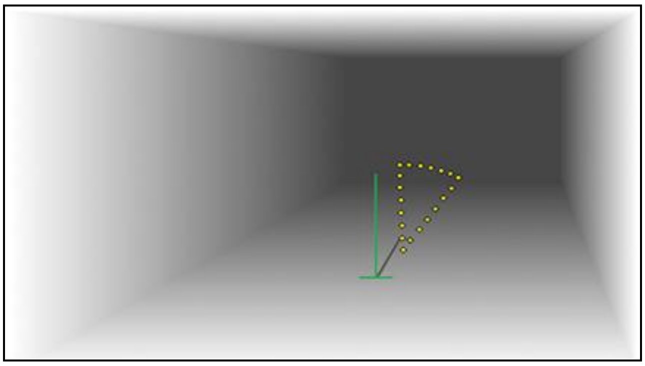

Fig 2: Eye Hand Coordination Test on Vienna Test System

Statistical Technique

Results

The main purpose of the study was to see the effect of 6 Weeks coordination training on hand eye coordination of young players. To analyze the effects of coordination training on on hand eye coordination ANCOVA was applied. Different types of descriptive statistics such as mean and standard deviation was computed to describe each variable statistically. The level of significance was set at 0.05. Its results have been depicted in following tables-2.

Table 2: Descriptive Statistics of Eye Hand Coordination (in Degree)

Groups	Mean		Standard deviation	
	Pre test	Post test	Pre test	Post test
Experimental group	31.78	29.60	4.53	2.86
Control group	31.49	31.46	4.68	4.64

Table 2 shows that mean and standard deviation of eye hand coordination of experimental and control group. Mean and SD of pre test and post test of experimental group is 31.78 ± 4.53 & 29.60 ± 2.86 respectively and Mean and SD of pre test and post test of control group is 31.49 ± 4.68 & 31.46 ± 4.64 respectively.

Table 3: Levene's Test of Equality of Error Variances

F	df1	df2	p-value
0.495	1	28	0.488

Levene's test was used to test the equality of variances for eye hand coordination, Where the F-value was insignificant being the p-value (0.488) was more than 0.05. It was concluded that the equality of variances might be accepted, and variances of the two groups were equal. The results were presented in Table 3.

Table 4: Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	p-value
Pre test	360.890	1	360.890	173.177	0.000*
group	32.678	1	32.678	15.681	0.000*
Error	56.266	27	2.084		
Total	28405.530	30			
Corrected Total	443.103	29			

*Significant at 0.05 level

Table 4 shows that the p-value (0.000) is less than 0.05, which demonstrates that the F- value for Pretest is significant. It demonstrates that the starting circumstances for the two groups were different.

The f-value used to compare the post-test adjusted means of the experimental and control groups. I t is significant because the p-value for statistics is 0.000, which is less than 0.05. Therefore, it indicates that the null hypothesis may be reject as there is no difference between the post means of the data on eye-hand coordination for the two groups.

Table 5: Pairwise Comparisons

(I) group	(J) Group	Mean Difference (I-J)	Std. Error	p-value
Experimental Group	Control Group	-2.088	.527	0.000*

*Significant at 0.05 level

Table 5 shows that mean difference among control group and experimental group was -2.088. It is significant since the p-value for statistics is 0.000, which is less than 0.05. Therefore, at a 5% level, the null hypothesis that there is no difference between the post means of the data on eye hand coordination for the two groups may be rejected.

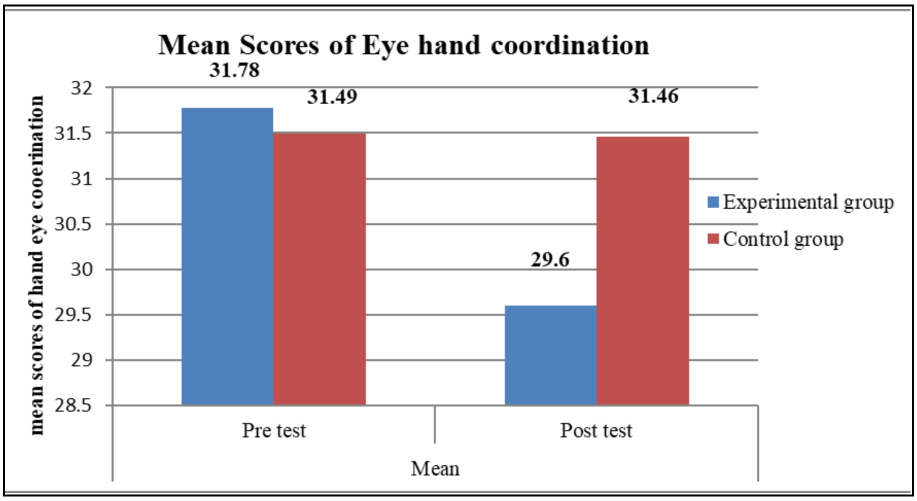

Fig 3: Graphical representation of pre test scores and post test score of eye hand coordination

Discussion and Findings

From the above mentioned results it clearly reveals that that a 6-week coordination programme plays an important role to enhancing eye-hand coordination. Eye hand coordination showed significant results. So form this it is inferred that if we provide 6- week Coordination training to young cricketer than there would be significant improvement in their eye hand coordination.

Eye-hand coordination is a skill that can be trained and may contribute to increasing the player's motor potential (Vine & Wilson, 2011) [11]. It can also influence movement efficiency and thus improve the player's performance in competitive circumstances Jelsma *et al*. (2014) [4] found a lack of adaptation for the learning process and suggested that young players may have trouble picking up fresh skills. However, if a child is exposed to only a limited type of drills then the learning new skills becomes difficult. It is advised that training last longer than six weeks in order to demonstrate results because youngsters between the ages of 7 and 12 have a slow learning rate. Skill coordinative abilities learned at faster in early childhood whereas the early matures and late matures have variations in acquiring skills. A coordinative ability is highly influenced by neuronal variability i.e., if a child is exposed to different kind of motor drills in growing days i.e., his/her physical literacy will be more refined and learning/competency in skills becomes easier at later stage. So they need more time for adaptation process. If the children get more learning time, the higher score will get. Abhaydev (2020) [1] reported that the fast drills with highest intensity and full recovery improved the movement speed and the coordinative abilities. Paweł, Krzysztof, Maciej, Gabriel & Justyna (2017) [7] analyze the impact of movement exercises using a reaction ball on the level of selected coordination skills in male basketball players and obtained results indicate that the exercises used in the study can significantly support the development of eye-hand coordination, which directly translates into technical superiority and movement efficiency.

Reference

1. Abhaydev CS, Bhukar J, Thapa RK. Effects of IAAF Kid's Athletics Programme on Psychological and Motor Abilities of Sedentary School Going Children. Physical Education Theory and Methodology. 2020;20(4):234-241.
2. Crawford J, Medendorp W, Marotta J. Spatal Transformatons for Eye-Hand Coordnaton. Journal of Neurophysology. 2004;92(1):10-19. http://dx.do.org/10.1152/jn.00117.2004
3. Grasso B. Coordnaton & Movement Skll Development – The Key to Long-Term Athletc Success; c2017. www.performbetter.com. Retreved 27 September 2023, from https://www.performbetter.com
4. Jelsma D, Geuze RH, Mombarg R, Smits Engelsman BCM. The impact of Wii Fit intervention on dynamic balance control in children with probable Developmental Coordination Disorder and balance problems. Human Movement Science. 2014;33:404-418.
5. Kandel ERC R, Scwartz James H, Jessel Thomas M. Prncples of Neural Scence 4th Edton. McGraw-Hll. New York; c2000.
6. Nobel CE. The learnng of psychomotor sklls. Annual Revew of Psychology. 1968;19:203-250.
7. Paweł L, Krzysztof P, Maciej Ś, Gabriel B, Justyna L. The impact of exercises with a reaction ball on the eye-hand coordination of basketball players. In 11th International Conference On Kinanthropology "Sport and Quality of Life. 2017, 347-358.
8. Thompson PJ (Ed.). Introduction to coaching theory. International Amateur Athletic Federation, 1991.
9. Schwab S, Memmert D. The mpact of a sports vson tranng program n youth feld hockey players. Journal of Sports Scence and Medcne. 2012;11(4):624-631.
10. Snger RN, Couraugh J. Attentonal control dstracter and motor performance. Human performance. 1991;4(1):55-69.
11. Vine SJ, Wilson MR. The influence of quiet eye training and pressure on attention and visuo-motor control. Acta psychologica., 2011; 136(3):340-346.