

# The Effect of Balance and Co-Ordination Training on Agility in Young and Adults College Level Players

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**Abstract: BACKGROUND:** Balance Training are often implemented for optimizing performance, Preventing injury, or providing rehabilitation. Neuromuscular training programs that include balance training in reducing sport-related injury risk as well as in enhancing functional performance after sport injury. Balance is required in the performance of a large number of motor tasks. In order to ensure successful performance in sports activities. Agility is defined as the ability to change direction quickly, maintaining balance without loss of speed. The effects of balance and coordination training on agility in young and adults in college level players is less described so this study focuses on the effect of balance and coordination training to improve the agility in college level players

**METHODOLOGY:** Total 60 male subjects with an age group 12-16 years and 18-30 year was recruited for the study. They was randomly assigned to two groups with 30 subjects in each group. In Group A- young age group. group B- adult age group.

**RESULT:** The 2-t Confidence level of all tests shows significant change observed i.e. null hypothesis is rejected and alternate hypothesis is accepted, so that we observed significant improvement in balance & coordination training on agility in young and adult college level players, agility training program under strict prescribed technical norms.

**CONCLUSION:** Hence we concluded that Overall, based on results of this study and previous research, it can be said that the effect of balance and coordination exercises on agility in young and adults college level payers is well observed so the null hypothesis is rejected and alternate hypothesis is accepted.

*Keywords: CO-co-ordination, CLP- college level players.*

## INTRODUCTION

In order to ensure successful performance in sports activities, it is necessary to maintain high level motor performance, and to maintained sustain static and dynamic balance<sup>11</sup>.

Neuromuscular training programs that include balance Training are often implemented for optimizing performance, Preventing injury, or providing rehabilitation. Emery CA, Cassidy JD and other authors<sup>1-2-3</sup> have shown the effectiveness of neuromuscular training programs that include balance training in reducing sport-related injury risk as well as in enhancing functional performance after sport injury<sup>4</sup>.Physical activity guidelines for older people mirror these findings incorporating the training of endurance, balance, strength and flexibility<sup>5</sup>.Few studies<sup>30</sup>have assessed the effects of a neuromuscular and performance enhancement training program in adolescent tennis players, especially those who participate in school or local tournaments, but are not on an elite or national level. The majority of investigations related to tennis either assessed physiological profiles, analysed the results of one training session<sup>31</sup>.

Balance is the base of all movements. There is a constant loss and recovery of balance during movement<sup>6</sup>. Balance is required in the performance of a large number of motor tasks<sup>7</sup>. In order to ensure successful performance in sports activities, it is necessary to maintain high level motor performance, and to maintain and sustain static and dynamic balance<sup>8</sup>. Fear of falling can lead to activity restriction that is self-imposed rather than due to actual physical impairments Plyometric training involves exercises that generate quick, powerful movements involving explosive concentric muscle contraction preceded by an eccentric muscle action<sup>28</sup>.In a different study male professionals were trained for 7 weeks and it was found that PT combined with strength training improved various dynamic measures, but not vertical jump performance<sup>29</sup>.In a sporting situation, changes of direction may be initiated to either pursuer evade an opponent or react to a moving ball. There-fore, it has

been recognized that a component of agility performance is the response to a stimulus<sup>33</sup>.

The studies show that agility is an important measure of performance in the soccer. Generally, agility is defined as the ability to change direction quickly. In addition, agility includes explosive acceleration, deceleration, and maintaining postural control during the sudden change of direction, gathering speed fast by reducing the decrease in running speed<sup>9</sup>. In short, agility is defined as the ability to change direction quickly, maintaining balance without loss of speed<sup>10</sup>. This ability is a determinant of sport performance in field and court sports, evidenced by time-motion analysis, validation of testing batteries for elite and non elite performers, and coaching analyses for various team sports<sup>25</sup>. Running at high speed is component of children's play, and have been shown to promote development of the muscular system and to stimulate to the long-term effect on higher bone density in the skeletal system<sup>32</sup>.

Poor motor proficiency has been researched extensively, particularly in those diagnosed with Developmental Coordination Disorder (DCD), a condition characterized by the inability to execute movement skills at an age appropriate Level<sup>12</sup>. They must maintain their center of gravity within the base of support while performing very rapid and asymmetrical upper limb movements<sup>13</sup>. Eye-hand coordination is the ability of the central nervous system to coordinate the information received from the eyes to control, guide, and direct the hands in the accomplishment of a given task such as catching a ball<sup>14</sup>. Investigations on the effects of a coordination training as balance training on strength gain have rarely been performed. When done, it was usually in connection with complicated Injuries, during which coordination training was normally coupled with a strength training program<sup>24</sup>. Although coordination abilities are essential learning requirements in order to perform well and to develop optimal tennis strokes and movement technique<sup>27</sup>.

The effects of balance and coordination training on agility in young and adults in college level players is less described so this study focuses on the effect of balance and coordination training to improve the agility in college level players.

#### HYPOTHESIS

NULL HYPOTHESIS [H<sub>0</sub>]:

To effects of balance and coordination training on agility in young and adults college level players is not observed.

#### ALTERNATE HYPOTHESIS [H<sub>1</sub>]:

The effects of balance and coordination training on agility in young and adults college level players is observed.

#### METHODOLOGY

##### SUBJECT-

Total 60 subjects will be taken according to the Inclusion and Exclusion criteria, those who satisfy the criteria will allow to perform study.

##### SPACE AND LOCATION-

All subjects are taken from Saii college of medical science and technology, Kanpur

##### SELECTION CRITERIA-

Inclusion criteria:

- ▶ Young and adults male players within age group of 12-16 years and 18 -30 years.
- ▶ Players who have no previous musculoskeletal injury.
- ▶ Gender- Male only
- ▶ College level players
- ▶ Participants agreed with the study.

Exclusion criteria:

- ▶ Players who had ankle sprain /injury last 3months.
- ▶ Fractures in the lower limb.
- ▶ Pain in lower limb.
- ▶ Recent injury
- ▶ Trauma of lower limb
- ▶ Ligament reconstruction

Equipment:

- ▶ Subject assessment and consent form
- ▶ Inch tape
- ▶ Cones
- ▶ Weighting machine
- ▶ Whistle
- ▶ Stopwatch

#### PROCEDURE

- ▶ In total 60 players were subjected to the training programme, 30 players of age (12-16 years) are to be taken from the school level players and other 30 players are taken from the college level players.

- ▶ The training session is about 6-weeks of balance and coordination exercises on the agility in the players. So the training session includes 3 days a week, and for 40 minutes a day. We also includes warm up for 2 minutes.

Outcome measures:-

- ▶ 1.T agility test
- ▶ 2.Hexagonal agility test
- ▶ 3.Single limb stance test
- ▶ Multidirectional reach test

Four-week Balancing and Coordination training program:

(1-2 Week)

Exercise	Sets	Repetitions
Standing in tandem and passing ball	3	20
Walking in tandem	3 minutes	N.A
Square locomotion	3	10
Sprint and collect	3	10
Figure-8	3	10
High knees	3	10

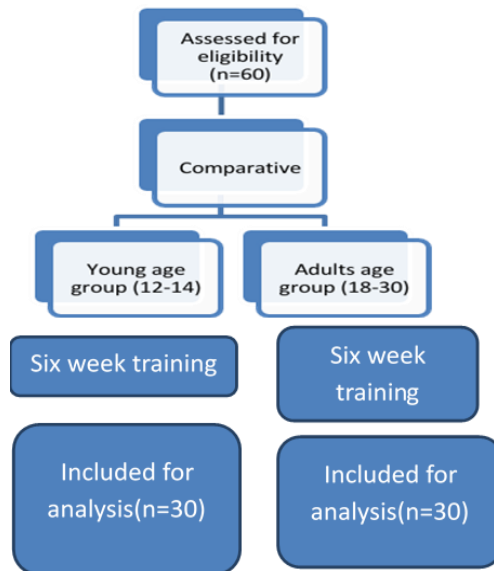
(3-4Week)

Exercise	Sets	Repetition
Standing in tandem and passing the ball	3	20
Walking in tandem	3 minutes	N.A
Square locomotion	3	10
Sprint and collect	3	10
Forward and backward Shuffling	3	10
High Knees	3	10
Zig-Zag Forward and Backward sprint	3	10

(5-6 Week)

Exercise	Sets	Repetition
Standing on in tandem	3 minutes	N.A
Single limb stance	3 minutes	N.A
Heel raises	3	20
High knee	3	10
Sprint and collect	3	10
Figure 8	3	10
Zig-Zag sprint	3	10
Forward and backward shuffling	3	10

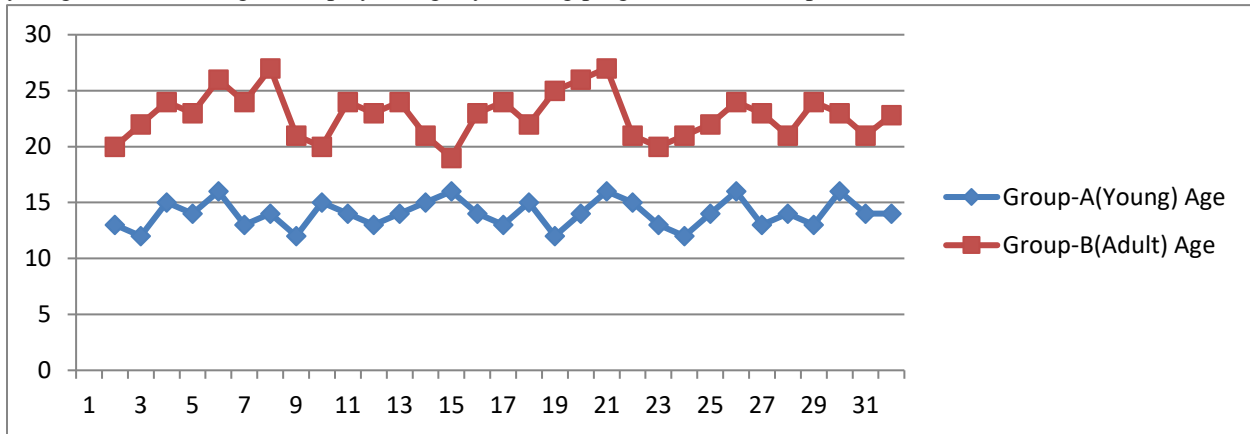
PROTOCOL



RESULT

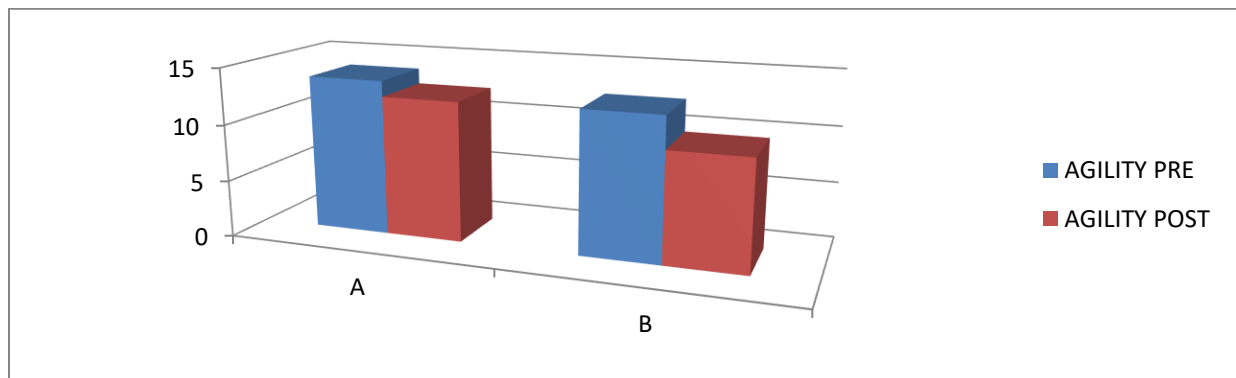
TEST	SD	T	DOF	2-t Confidence Level
AGILITY TEST (A&B)	0.140185	31.9868	8	100%
HEXAGONAL AGILITY (A&B)	8.698	4.2375	8	99.72%
MDR TEST	10.31236	7.5478	8	99.99%

The 2-t Confidence level of all tests shows significant change observed i.e. null hypothesis is rejected and alternate hypothesis is accepted, so that we observed significant improvement in balance & coordination training on agility in young and adult college level players, agility training program under strict prescribed technical norms.



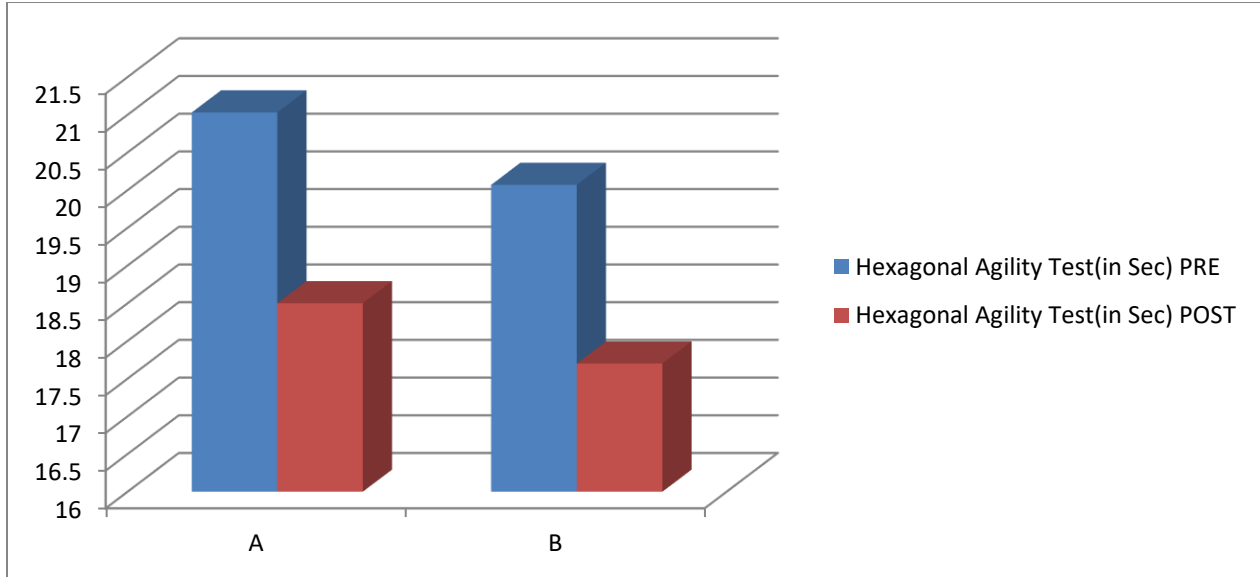
Graph-1: Represents the Age wise distribution of all study subjects, A finding shows mean age ( $\pm$ SD) is 21.23 ( $\pm$ 4.64) years, which represents young aged & adult participants.

	AGILITY	
	PRE	POST
A	13.73	12.36
B	12.53	9.7



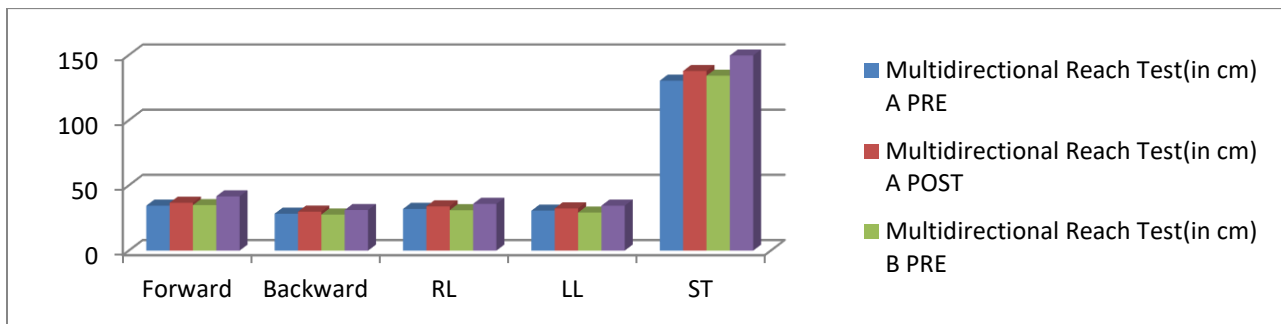
Graph-2: Represents the Agility wise distribution of all study subjects of both group.

	Hexagonal Agility Test(in Sec)	
	PRE	POST
A	21.03	18.5
B	20.07	17.7



Graph-3: Represents the Hexagonal agility test wise distribution of all study subjects.

Multidirectional Reach Test(in cm)				
	A	A	B	B
	PRE	POST	PRE	POST
Forward	34.5	36.7	34.91	41.63
Backward	28.33	29.9	27.67	31.16
RL	32	33.97	31	35.87
LL	30.67	32.4	29.22	34.5
ST	130.4	137.8	134.2	149.7



Graph-4: Represents the duration of Pre & Post multidirectional reach test wise distribution of all study subjects, which represents significant improvement in Pre to post reading in all participants.

### DISCUSSION

Total 60 subjects were taken according to the inclusion & exclusion criteria, those who satisfied the criteria were allowed to perform the study, total 60 subjects successfully completed the study. All the subjects were taken from Kanpur sports academy, Kanpur on inclusion criteria such as gender male, young aged between 19 to 24 years with no existing musculoskeletal problems. We excluded the subjects

with recent fracture/sprain/strain at beginning or during study, we cant allowed any nutritional supplements in diet & participants also not allowed to take anabolic-androgenic steroids or any other drugs that might affect their physical performance or hormonal imbalance prior/during the study. Zahoor Ahmad Bhat et al (2018) conducted that the result of the study revealed that the training group has significant improvement in cricket batting ability among college level men cricket players after the

cricket specific training protocol. It was also concluded that this cricket specific training is one of the best training methods for increasing the cricket batting ability and as well as the physical fitness of cricket players; as we found in our study too.

We found as Eric Lichtenstein et al in their study also concluded that we compared the adaptation to two exercise based interventions in older adults and found similar change in both groups. The agility training might lead to favourable adaptation in explosive power of the muscle groups .the long -term investigation of this integrative multi-model exercise –training program also with regard to cognitive performance ,control of locomotion , muscle architecture and “hard” endpoints like falls or institutionalization should be considered in future research .the agility training approach could be regarded as a time efficient alternative for exercise training in older adults as a relevant aspects of human performance in ageing are trained simultaneously

Zoran Milanovic et al (2013) i n their study concluded that the seven different phases of a specific speed and agility ( SAQ) training programme ( Pearson, 2001) contributed to a statistically significant improvement in performance in different agility tests with and without the ball U19 soccer players. Whilst is impossible to determine which any individual components had significant and non- significant contributions the overall effect led to an improvement in agility. These findings support the contention that the SAQ programme should be a part of routine soccer training. The extent to which SAQ training needs to be further investigated as it appears anecdotally that agility training, form any teams, is not undertaken to the extent that it should be. Research suggests that appropriate SAQ training will improve soccer players’ agility and condition them to cope with actual demands of the game; we also concluded the same conclusion in our study.

We also support that Agility testing is generally confined to tests of physical components such as change of direction, speed, or cognitive components such as anticipation and pattern recognition. Agility training is thought to be a reinforcement of motor programming through neuromuscular conditioning and neural adaptation and muscle spindle , golgi tendon organs [GTO] and joint proprioceptors . Performance is often dependent on the athlete’s jumping ability during offensive and defensive skills,

so its shows significant improvement in flexibility & fitness level.

#### CLINICAL IMPLICATIONS

These data suggest that young cricketer participants who successfully completed the 6 weeks SAQ agility program have significant improvement in balance and co-ordination training on agility in young and adults college level players shows significant outcome.

#### FUTURE RESEARCH

This study was conducted for a short period only, future research involving a longer time period & comparing the effects of the two intervention program is possible, not only in specific area of sports but other sports specifications.

#### LIMITATION OF THE STUDY

A small sample size was one of the major limitations of the study. Many participants injured during study due to other activities as its difficult to restrict other physical sports activities for 6wks long duration.

#### CONCLUSION

Hence we concluded that Overall, based on results of this study and previous research, it can be said that the effect of balance and coordination exercises on agility in young and adults college level payers is well observed so the null hypothesis is rejected and alternate hypothesis is accepted.

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