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# EFFECTS OF PROPRIOCEPTIVE TRAINING WITH PNF STRETCHING ON SELECTED MOTOR FITNESS COMPONENTS AMONG INTER-COLLEGIATE LEVEL FIELD HOCKEY PLAYERS

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**Abstract:**

The purpose of the study was to investigate effects of proprioceptive training with PNF stretching on selected motor fitness components among inter-collegiate level field hockey players. In this study, a total of thirty players were randomly selected from SRMV Maruthi College of Physical Education, Coimbatore, with ages ranging between 18 and 23 years. The participants were divided into two groups of fifteen each and assigned as control group and experimental group. The experimental treatment was applied only to the experimental group for a period of six weeks, while the control group did not receive any intervention. The proprioceptive training combined with PNF stretching was conducted thrice a week. After six weeks, the final performance of both the control and experimental groups was assessed. The significant differences between the pre-test and post-test scores of the experimental and control groups were determined using a dependent t-test. The level of significance was set at 0.05 for a degree of freedom of 1 and 14. The results indicated that the experimental group showed significant improvement in the selected motor fitness components.

**Key Words:** Proprioceptive Training, PNF Stretching, Motor Fitness Components.

## Introduction:

Field hockey is a demanding sport that requires agility, balance, coordination, flexibility, and strength for peak performance (Bompa & Haff, 2009). Developing these motor fitness components enhances athletic ability and minimizes injury risks. Among various training techniques, proprioceptive training and Proprioceptive Neuromuscular Facilitation (PNF) stretching are widely recognized for improving neuromuscular control and flexibility.

Proprioceptive training enhances body awareness, stability, and balance through controlled movements, which are essential for rapid directional changes in field hockey (Shumway-Cook & Woollacott, 2017). PNF stretching, as explained by Magnusson and Renström (2006), increases flexibility by using alternating muscle contractions and relaxations to improve range of motion.

Although these methods are individually beneficial, limited research examines their combined effects on motor fitness components in field hockey players. Behm and Chaouachi (2011) emphasize neuromuscular activation in optimizing training adaptations, suggesting that integrating proprioceptive training with PNF stretching could be advantageous for athletes.

This study aims to analyze the effects of proprioceptive training combined with PNF stretching on selected motor fitness components in inter-collegiate field hockey players. The findings may help coaches, trainers, and athletes develop structured training programs to enhance performance and reduce injury risks in competitive hockey.

## Methodology:

### Selection of Subjects:

The purpose of the study was to investigate effects of proprioceptive training with PNF stretching on selected motor fitness components among inter-collegiate level field hockey players.

In this study, a total of thirty players were randomly selected from SRMV Maruthi College of Physical Education, Coimbatore, with ages ranging between 18 and 23 years. The participants were divided into two groups of fifteen each and assigned as control group and experimental group. The experimental treatment was applied only to the experimental group for a period of six weeks, while the control group did not receive any intervention. The proprioceptive training combined with PNF stretching was conducted thrice a week. After six weeks, the final performance of both the control and experimental groups was assessed. The significant differences between the pre-test and post-test scores of the experimental and control groups were determined using a dependent t-test. The level of significance was set at 0.05 for a degree of freedom of 1 and 14.

### Criterion Measures:

| | | |
|---|---|---|
| 1 | Dynamic Balance | Modified Bass Test of Dynamic Balance |
| 2 | Muscular Strength and Endurance | The curl up test |

### Research Design:

The study used a two-group experimental approach, incorporating pre-test and post-test assessments for comparison. The independent variable was the intervention type, which proprioceptive training with PNF stretching and was applied exclusively to the experimental group. The dependent variables were specific motor fitness elements, evaluated before and after the intervention. The research aimed to determine the impact of the proprioceptive training program on these elements. Both groups underwent testing for the same motor fitness components at the start (pre-test) and conclusion (post-test) of the study. The experimental group participated in the intervention for six weeks, with sessions conducted thrice a week, while the control group did not receive the intervention. This design enabled a comparison of motor fitness changes between the two groups.

**Statistical Techniques:**

The data were analyzed using a dependent t-test, also referred to as a paired t-test, which is appropriate for comparing pre-test and post-test results within the same group. This method was employed to assess whether there were significant differences in motor fitness between the pre-test and post-test measurements for both the experimental and control groups. A significance level of 0.05 was used, with degrees of freedom calculated as 1 and 27 for each group. The dependent t-test enabled an evaluation of whether the proprioceptive training combined with PNF stretching led to a statistically significant improvement in the experimental group compared to the control group. If the p-value from the t-test was below 0.05, the null hypothesis would be rejected, suggesting a significant effect of the intervention. Conversely, if the p-value exceeded 0.05, no significant difference would be observed.

**Results:**

Table 1: Computation with 't' Test of Dynamic Balance on Experimental and Control Group on Inter-Collegiate Field Hockey Players

| Variable | Group | Test | Mean | S. D | D.M | σ DM | 't' |
|---|---|---|---|---|---|---|---|
| Dynamic Balance | Experimental Group | Pre Test | 5.13 | 0.63 | 3.07 | 0.26 | 46.00* |
| | | Post Test | 8.20 | 0.67 | | | |
| | Control Group | Pre Test | 5.13 | 0.63 | 0.20 | 0.41 | 1.87 |
| | | Post Test | 5.33 | 0.72 | | | |

* Significant at 0.05 level, Table value for df 14 was 2.14

Table 1 highlights the mean and standard deviation of dynamic balance for both the experimental and control groups of hockey players. The experimental group's pre-test and post-test mean scores were 5.13 and 8.20, respectively, with standard deviations of 0.63 and 0.67. The calculated 't' value of 46.00 exceeded the table value of 2.14 at 14 degrees of freedom. In contrast, the control group's mean scores were 5.13 and 5.33, with standard deviations of 0.63 and 0.72, and the 't' value of 1.87 fell below the table value of 2.14. The results suggest that the experimental group showed significant enhancement in dynamic balance, attributed to proprioceptive training combined with PNF stretching among hockey players.

Figure 1: The Bar Diagram Shows That the Pre and Post Test Means of Experimental and Control Groups on Dynamic Balance of Inter-Collegiate Field Hockey Players

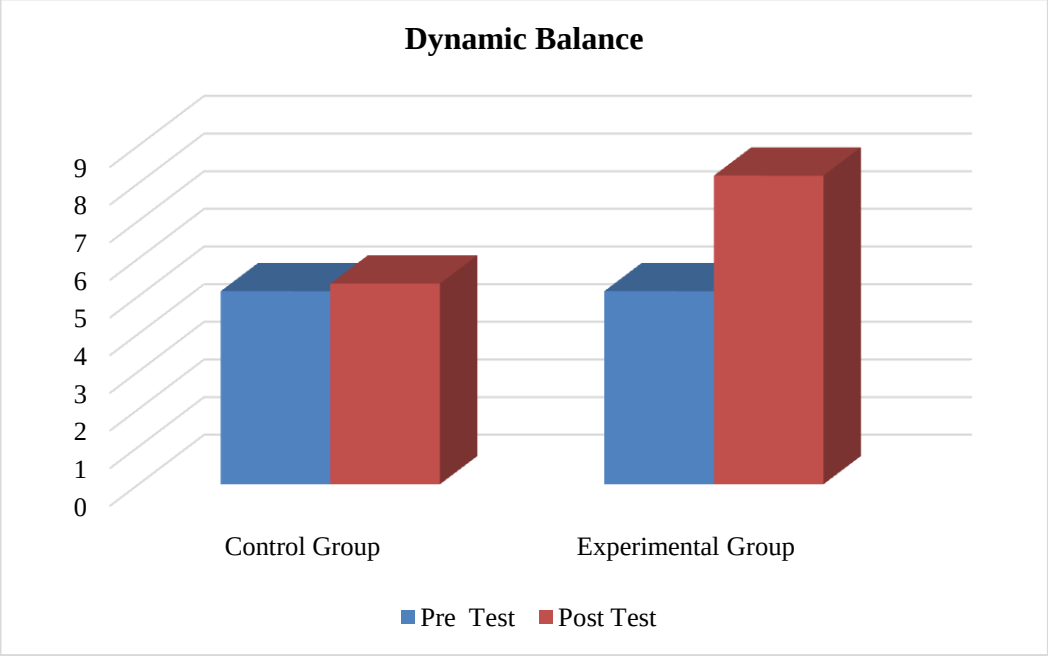


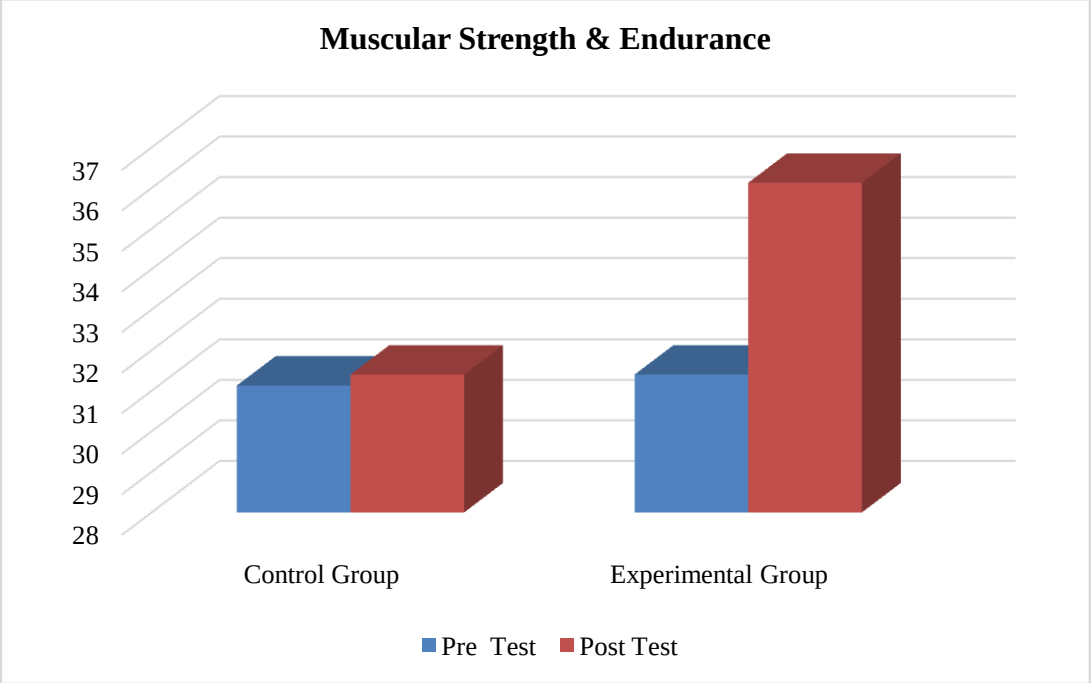

Table 2: Computation with 't' Test of Muscular Strength and Endurance on Experimental and Control Group on Inter-Collegiate Field Hockey Players

| Variable | Group | Test | Mean | S. D | D.M | σ DM | 't' |
|---|---|---|---|---|---|---|---|
| Muscular Strength and Endurance | Experimental Group | Pre Test | 31.40 | 3.22 | 4.73 | 1.87 | 9.80* |
| | | Post Test | 36.13 | 3.54 | | | |
| | Control Group | Pre Test | 31.13 | 3.16 | 0.27 | 0.59 | 1.74 |
| | | Post Test | 31.40 | 3.02 | | | |

*Significant at 0.05 level, Table value for df 14 was 2.14

Table 2 highlights the mean and standard deviation of muscular strength and endurance for both the experimental and control groups of hockey players. The experimental group's pre-test and post-test mean scores were 31.40 and 36.13, respectively, with standard deviations of 4.73 and 0.27. The calculated 't' value of 9.80 exceeded the table value of 2.14 at 14 degrees of freedom. In contrast, the control group's mean scores were 31.13 and 31.40 with standard deviations of 0.27 and 0.59, and the 't' value of 1.74 fell below the table value of 2.14. The results suggest that the experimental group showed significant enhancement in muscular strength and endurance, attributed to proprioceptive training combined with PNF stretching among hockey players.

Figure 2: The Bar Diagram Shows That the Pre and Post Test Means of Experimental and Control Groups on Muscular Strength and Endurance of Inter-Collegiate Field Hockey Players




**Conclusion:**

The combination of proprioceptive training and PNF stretching proved effective in improving dynamic balance, muscular strength and endurance among inter-collegiate field hockey players in the experimental group. Meanwhile, the control group did not demonstrate notable progress in these areas.

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