Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS
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5.1. SUMMARY

Hamstring strains are one of the most common, recurrent injuries experienced in the badminton world and often result in significant time out of the sport. Decreased hamstring flexibility is suggested to be one of the predisposing factors for hamstring strains. In addition to that flexibility is used as one of the most important factors in physical fitness in which advancement increases the range of motion in doing sport skills, and muscular relaxation, and avoids muscular injury and tendon. The studies show that the athletes with reduced range of motion are more susceptible to muscle injury than their more flexible counterparts. Besides professional exercises, flexibility plays an important role in general health. For example, stretch exercises are prescribed for pains in the lower part of spinal cord. There are different methods to get suitable flexibility and more motional domain of joints which are Massage and Stretch; however, introducing the best possible method in getting suitable flexibility is the subject of many recent researches.

Massage dates back to early civilization and has a long history of use in sports medicine. Massage has been widely used in the prevention and management of injuries in sport, with recent recognition and acceptance in Olympic sport.

Muscular strains of the lower limb are among the most common injuries in sport. They make up one third of all referrals to sports physicians and their frequency and disabling effect is well documented. Hamstring injuries in particular are the most
common type of muscular strain to effect the lower limb in the elite athlete. They are associated with sports which involve rapid acceleration or deceleration, jumping, cutting, pivoting, turning or kicking. They are particularly associated with Australian Rules Football (AFL) rugby and soccer. They result in significant time off sport, can be the source of considerable pain and can result in impaired performance on return to activity.

A common soft tissue injury in sports involving sprinting and jumping is the hamstring strain. A major problem with hamstring strains is the high incidence of reinjury. Muscle injuries can be classified as direct or indirect and are typically grouped into three categories according to severity. A number of potential risk factors have been proposed for hamstring strains. Only a few are evidence based and some are mainly based on theoretical assumptions. There is a lack of clinical research on the effectiveness of rehabilitation programmes for hamstring strains. Although the initial treatment of rest, ice, compression, and elevation is accepted for muscle strains, no consensus exists for their rehabilitation. Not much evidence based research has been carried out on prevention of hamstring strain.

In this context, the investigator has made an attempt to study the effects of Progressive Agility Trunk Stabilization (PATS) Exercises and Manual Intervention Therapy on Rehabilitation of Acute Hamstring strain and selected Physical Fitness variables of Male athletes.

To achieve the purpose forty five (N=45) male hamstring strain Grade-I injured athletes in the state of Tamilnadu, India were selected as subjects during the year 2015-2016. The subjects were divided at random into three groups of fifteen each (n=15). Group-I underwent Progressive Agility Trunk Stabilization (PATS) Exercises,
Group-II underwent Manual Intervention Therapy and Group-III acted as Control. The Rehabilitation Programme period was limited to three days per week for twelve weeks. The dependent variables selected for this study were as follows: Sports Injury variable such as Hamstring Strain, Physical Fitness variables such as Speed, Strength, Agility, Flexibility, Endurance and Leg Explosive Power. All the subjects were tested prior to and immediately after the experimental period on the selected dependent variables.

The data obtained from the experimental groups before and after the experimental period were statistically analyzed with dependent 't'-test and Analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post test means was found to be significant, the Scheffe's Post hoc test was applied to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases.

5.2. CONCLUSIONS

From the analysis of the data, the following conclusions are drawn:

1) The Experimental groups, namely Progressive Agility Trunk Stabilization (PATS) Exercises group and Manual Intervention Therapy (MIT) group have shown significant decrease in selected sports injuries related variable, namely Hamstring Strain.

2) Significant differences in achievement have been found among Progressive Agility Trunk Stabilization (PATS) Exercises group, Manual Intervention Therapy (MIT) group and Control group in sports injuries related variable, namely Hamstring Strain.

3) The Experimental groups, namely Progressive Agility Trunk Stabilization (PATS) Exercises group and Manual Intervention Therapy (MIT) group have shown significant decrease in selected physical fitness related variables, namely Speed and Agility.
4) The Experimental groups, namely Progressive Agility Trunk Stabilization (PATS) Exercises group and Manual Intervention (MIT) Therapy group have shown significant increase in selected physical fitness related variables, namely Strength, Flexibility, Endurance and Leg Explosive Power.

5) Significant differences in achievement have been found among Progressive Agility Trunk Stabilization (PATS) Exercises group, Manual Intervention Therapy (MIT) group and Control group in physical fitness related variables, namely Speed, Strength, Agility, Flexibility, Endurance and Leg Explosive Power.

6) The Manual Intervention Therapy (MIT) group has been found to be better than the Progressive Agility Trunk Stabilization (PATS) Exercises group and Control group in decreasing Hamstring strain, Speed and Agility, and increasing Strength, Flexibility, Endurance and Leg Explosive Power.

5.3. RECOMMENDATIONS

Based on the conclusion, the following recommendations were made.

1. The results of the study gave an idea to the coaches, Physical educators, Physiotherapist and Orthopedic Surgeon to know the effects of Progressive Agility Trunk Stabilization (PATS) exercises and Manual Intervention Therapy on selected Criteria Variables.

2. A similar study can be conducted with female subjects, by reducing the training volumes.
3. The similar studies may be conducted by adding many numbers of Physical and Physiological variables.

4. Similar study may be conducted with Bio-Mechanical and Bio-Chemical variables.

5. The same study may be conducted on athletes of other age groups and other games like kabadi, football, cricket,