

Evaluating the Injury-Prevention Potential of the Fifa 11+ Warm-Up Protocol in Intermediate-Level Football Athletes

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<https://doi.org/10.55041/ijssmt.v2i10.066>

Cite this Article: Singh, (. D. K., Parashar, D. M., Buliya, A., Yadav, R., Singh, R. & Jadon, P. (2026). Evaluating the Injury Prevention Potential of the Fifa 11+ Warm Up Protocol in Intermediate Level Football Athletes. International Journal of Science, Strategic Management and Technology, 02(10), 1-9. <https://doi.org/10.55041/ijssmt.v2i10.066>



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ABSTRACT

Background

Football injuries is one of the common medical conditions which often affects the players performance. These injuries may be caused by both modifiable and nonmodifiable factors, justifying the adoption of an injury prevention program such as the Federation Internationale de Football Association (FIFA) 11+. Warm up exercises have a greater effect on injury prevention. There is limited literature regarding the effects of the FIFA 11+ on intermediate football players, especially in Kerala. So the need for the study is to find out the effect of FIFA 11+ warm up protocol among intermediate football players in Kerala.

Objectives

To study the effectiveness of FIFA 11+ warm up protocol in preventing injuries among intermediate football players in Kerala.

Study Design: Experimental study design, pre-test and post- test with control group.

Methodology

Total of 60 subjects who fulfilled the inclusion criteria were selected and divided into two groups of 30 each as experimental group (group A) and control group (group B) using simple random sampling. A brief explanation about the procedure was given to the subjects and a written consent form was obtained from each of the subjects. The experimental group subjects were treated with FIFA 11+ warm up protocol along with conventional warm up protocol. (Running exercises -2minutes, Strength and Plyometrics -8minutes. Balance-10minutes) and the control group subjects were undergone conventional warm up protocol only for 5 session per week for 3 weeks with one session per day. Pre-test and post-test values were collected using as F-MARC Questionnaire for the documentation of injuries. Pretest and Post- test data were analysed using independent and paired T test as statistical tool.

Results

Based on the statistical analysis the result of this study showed a significant difference of $p < 0.05$ between the FIFA 11+ warm up protocol and the control group warm up protocol. In conclusion, the study concludes that the FIFA 11+ warm up protocol is beneficial in reducing the number of injuries during football.

Conclusion

The study concluded that FIFA 11+ warm up protocol exercises is more effective in preventing injuries among intermediate football players in Kerala

KEYWORDS- FIFA 11+ warm up programme, injury prevention, intermediate football players,

INTRODUCTION

Football is one of the most popular sports worldwide and involves a combination of physical fitness, technical skills, tactical awareness, and coordinated body movements. The sport requires athletes to perform repeated high-intensity activities, including sprinting, acceleration, deceleration, jumping, landing, kicking, tackling, and rapid changes of direction. These activities place considerable demands on the musculoskeletal system and require adequate strength, flexibility, balance, coordination, and neuromuscular control. Although regular participation in football provides several physical and psychological benefits, the repetitive and physically demanding nature of the sport exposes players to a risk of musculoskeletal injuries. Football-related injuries may affect the lower extremities, particularly the ankle, knee, thigh, and groin regions, and can result in pain, reduced performance, missed training sessions, and temporary or prolonged absence from competition. Therefore, injury prevention has become an important component of sports physiotherapy and athletic conditioning.

Football injuries can be broadly classified into contact and non-contact injuries. Contact injuries occur due to collisions, tackles, or direct impact with another player or an object, whereas non-contact injuries occur without direct external contact and may be associated with landing mechanics, rapid changes in direction, sprinting, muscular fatigue, or inadequate neuromuscular control. Common football injuries include ankle sprains, hamstring strains, groin injuries, anterior cruciate ligament injuries, and other knee and lower-limb conditions. The occurrence of these injuries may be influenced by several factors, including previous injury, inadequate physical conditioning, muscle weakness, reduced balance, poor movement mechanics, training load, and fatigue. Although not all injuries can be prevented, structured injury-prevention programmes may help reduce the occurrence of certain common football injuries by improving physical capacity and movement control.

Intermediate-level football athletes represent an important population for injury-prevention research. These players generally participate in organized training and competition and may experience substantial physical demands while continuing to develop their strength, coordination, technical ability, and conditioning. Training schedules, playing surfaces, competition intensity, previous injury history, and access to sports science support may vary considerably among intermediate-level athletes. In some settings, warm-up routines may focus primarily on light jogging, stretching, and sport-specific drills without systematically incorporating strength, balance, landing control, and neuromuscular exercises. A structured warm-up programme may therefore provide an opportunity to improve physical preparedness and address selected modifiable injury risk factors in this population.

A warm-up is an essential component of sports participation because it prepares the body for the demands of physical activity. A well-designed warm-up typically includes progressive aerobic activity, dynamic movements, mobility exercises, and sport-specific drills. In addition to increasing body temperature and preparing the cardiovascular and musculoskeletal systems for exercise, an appropriately structured warm-up can incorporate exercises that target balance, muscular strength, coordination, and neuromuscular control. Traditional warm-up routines may not consistently address all these components. Consequently, injury-prevention programmes that combine several evidence-informed exercises have been developed to improve physical performance while potentially reducing the risk of common sports injuries.

The FIFA 11+ programme is a structured warm-up and injury-prevention programme developed for football players. It was designed to replace conventional warm-up routines with a comprehensive sequence of running, strength, balance, plyometric, and agility exercises. The programme generally consists of three main parts: running exercises at varying speeds combined with active stretching and controlled contact; strength, plyometric, and balance exercises; and further

running exercises involving changes of direction and acceleration. The second part incorporates exercises targeting the trunk and lower-extremity muscles, single-leg balance, movement control, jumping, and landing techniques. Exercise difficulty can be progressively increased according to the player's ability and performance. The programme is intended to be performed regularly as part of football training rather than as an occasional intervention.

One of the important components of the FIFA 11+ programme is the development of neuromuscular control. Neuromuscular control refers to the ability of the nervous system to coordinate muscle activation and joint movement during functional activities. In football, effective neuromuscular control is essential for maintaining stability during single-leg support, controlling the knee and ankle during landing, and responding appropriately to sudden changes in direction. Exercises involving balance, controlled jumping, landing, and directional changes may improve movement awareness and the coordination of muscle activity. These adaptations may help players manage the mechanical demands associated with football-specific movements and potentially reduce exposure to certain non-contact injuries.

Strengthening exercises included in the FIFA 11+ programme may also contribute to injury prevention by improving the capacity of the trunk and lower-extremity muscles. Adequate strength of the hip, thigh, calf, and trunk muscles is important for controlling lower-limb alignment and stabilizing the body during running, sprinting, jumping, and landing. Eccentric muscle control is particularly relevant during deceleration and landing, when muscles must absorb and control external forces. By combining strength exercises with plyometric activities and progressive running drills, the programme addresses several physical qualities required for safe and efficient football performance. However, the extent of these benefits may depend on exercise quality, progression, adherence, and the athlete's baseline physical condition. Balance and agility are additional components relevant to football injury prevention. Balance allows athletes to maintain or regain postural stability while moving, whereas agility involves changing direction rapidly and efficiently in response to movement demands. Football players frequently perform cutting, turning, pivoting, and single-leg actions under time pressure. Deficits in balance, movement coordination, or control during these tasks may contribute to unfavorable joint loading. The FIFA 11+ programme includes exercises designed to challenge postural stability, dynamic control, and movement technique. Improvements in these physical capacities may contribute to better control during football-specific tasks, although improvements in performance measures should not automatically be interpreted as proof that injury incidence has decreased.

Evaluating the injury-prevention potential of the FIFA 11+ programme requires consideration of both physical changes and actual injury outcomes. Injury incidence can be assessed by recording the number and type of injuries sustained during a defined observation period and relating them to athlete exposure, such as training and match hours. Injury severity, time lost from participation, and recurrence may also provide useful information. Physical performance measures, including balance, agility, lower-limb strength, and jump-landing control, may be used as secondary outcomes to assess changes in relevant functional characteristics. These measures provide information about potential mechanisms through which an intervention may influence injury risk, but they are not substitutes for directly recording injuries when the primary objective is to evaluate injury prevention.

The effectiveness of an injury-prevention programme may be influenced by the consistency with which athletes perform the prescribed exercises. Regular participation, appropriate supervision, correct technique, and progressive exercise difficulty are important considerations when implementing the FIFA 11+ programme. Coaches, physiotherapists, and sports trainers can play a significant role in encouraging adherence and ensuring that exercises are performed appropriately. In addition, injury history, training exposure, playing position, age, fitness level, and other relevant factors should be considered when evaluating programme outcomes. These factors may affect both the likelihood of sustaining an injury and the athlete's response to the intervention.

Previous research has investigated structured neuromuscular warm-up programmes in football and other sports, with evidence suggesting that programmes such as FIFA 11+ can reduce the risk of certain injuries when implemented consistently. Nevertheless, the magnitude of the benefit may vary across populations, competition levels, training environments, and adherence rates. Intermediate-level football athletes may differ from elite or recreational players in their physical conditioning, access to supervision, and training schedules. Therefore, evaluating the programme within this specific group may provide useful information regarding its practical implementation and potential benefits in the selected setting.

Although conventional warm-up routines remain common in football, a structured injury-prevention programme may provide a more systematic approach to addressing strength, balance, agility, and neuromuscular control. Investigating

the FIFA 11+ programme among intermediate-level football athletes may help determine whether its implementation is associated with changes in injury occurrence and relevant physical performance outcomes. Such evaluation can contribute to evidence-informed warm-up practices and support the development of injury-prevention strategies that can be integrated into regular football training.

Therefore, the present study, entitled **“Evaluating the Injury-Prevention Potential of the FIFA 11+ Warm-Up Protocol in Intermediate-Level Football Athletes,”** aims to evaluate the potential of the FIFA 11+ warm-up programme to reduce football-related injuries among intermediate-level players. Depending on the study design, injury incidence, injury characteristics, time lost from participation, and selected physical performance measures may be assessed before and during or after the intervention period. The study seeks to determine whether regular implementation of the FIFA 11+ programme is associated with a reduction in injury occurrence and improvements in relevant physical capacities. The findings may provide useful guidance for physiotherapists, coaches, and sports professionals seeking to incorporate structured injury-prevention strategies into football training and promote safer, more sustainable athletic participation.

METHODOLOGY

STUDY DESIGN

Experimental study design, pre-test and post- test with control group.

STUDY SETTINGS

Stadium Ground North Paravoor

SAMPLING

Simple random sampling

SAMPLE SIZE: Sixty

INCLUSION CRITERIA

1. Age between 17-25years
2. Male players are selected
3. Amateur football players

EXCLUSION CRITERIA

1. Previous history of covid-19.
2. A medical history of lower extremity injury that required medical attention in the past 6months
3. Systemic disease
4. Cardiovascular disease
5. Neurological disorders
6. Bone fractures
7. Surgery in the previous year.

STUDY DURATION: Total duration of study was six months

MATERIALS USED

1. Football instructional FIFA 11+ video
2. Prevention manual
3. Instructional loose-leaf exercise cards
4. Cones
5. F-MARC Questionnaire

OUTCOME MEASURES: F-MARC Questionnaire

STUDY PROCEDURE

Total of 60 subjects who fulfilled the inclusion criteria were selected and divided into two groups of 30 each as experimental group (group A) and control group (group B) using simple random sampling. A brief explanation about the procedure was given to the subjects and a written consent form was obtained from each of the subjects. The experimental group subjects were treated with FIFA 11+ warm up protocol along with conventional warm up protocol. (Running exercises -2minutes, Strength and Plyometrics -8minutes. Balance-10minutes) and the control group subjects were undergone conventional warm up protocol only for 5 session per week for 3 weeks with one session per day. Pre-

test and post-test values were collected using as F-MARC Questionnaire for the documentation of injuries. Pretest and Post- test data were analysed using independent and paired T test as statistical tool.

The program took twenty minutes to complete and were designed to be performed. No specific equipment is needed. The FIFA 11+ had three parts; with a total of 15 exercises which was performed in the specified sequence at the start of each training session. They were:

Part 1: running exercises at a slow speed combined with active stretching and controlled partner contacts. It encompassed cutting, change of direction, decelerating and proper landing techniques:



Fig. 1 Running exercises 8 minutes

Part 2: six sets of exercises focussed on core and leg strength, balance and plyometric /agility, each with three levels of increasing difficulty. Focused on core strength, eccentric control and proprioception.



Fig. 2 Strength, plyometric and balance exercises 10 minutes

Part 3: running exercises at moderate / high speed combined with planting / cutting movements. High-speed and change-of-direction running



Fig. 3 Running exercises 2 minutes

There were three levels for each specific exercise (level 1, level 2, level 3) that increased the difficulty of each respective exercise. This allowed for both individual and team progression throughout the course of the competitive season.



Fig. 4.4 difference levels of specific exercises

More traditional football warm-up programmes are quite variable and typically encompass running exercises, static and/or dynamic stretching, movements involving change of direction, and short passing. They typically average from five to 45 minutes in duration. The average warm-up programme does not typically emphasis qualitative movement.

A key point in the programme is to use the proper technique during all of the exercises. Pay full attention to correct posture and good body control, including straight leg alignment, knee-over-toe position and soft landing. FIFA Injury Prevention Basic Warm Up.

PART 1 RUNNING EXERCISES 8 MINUTES

This 20-minute warm up program, designed by FIFA, is designed to reduce injuries by up to 50 percent when performed prior to training. If you're warming up right before a soccer match, only do the running exercises (parts 1 and 3).

- *STRAIGHT AHEAD*

Make a course of up of six to 10 pairs of parallel cones, approximately five to six meters apart. Two players started at the same time from the same pair of cones. Jog together all the way to the last pair of cones. On the way back, they were said to progressively increase their speed as they warm up for two sets.



Fig. 5 Running Straight ahead

RUNNING - HIP OUT

Players were said to walk or jog comfortably, stopping at each pair of cones to lift their knee and rotate their hip outwards. They were said to alternate between left and right legs at successive cones. This was done for two sets.



Fig. 6 Running HIP out

- *HIP IN*

Players were said to walk or jog comfortably, stopping at each pair of cones to lift their knee and rotate hip inward. They were said to alternate between left and right legs at successive cones. This was done for two sets.



Fig. 7 Running HIP IN

RUNNING - CIRCLING PARTNER

The players were said to run forward in pairs to the first set of cones. Shuffle sideways to 90 degrees to meet in the middle. Shuffle an entire circle around one another and then return to the cones. Repeat for each pair of cones. Remember to stay on their toes and keep their center of gravity low by bending their hips and knees. They were said to perform two sets.



Fig. 8 Running-circling partner

– SHOULDER CONTACT

The players were instructed to run forward in pairs to the first pair of cones. Shuffle sideways by 90 degrees to meet in the middle then jump sideways toward each other to make shoulder-to-shoulder contact. The researcher assured to land on both feet with their hips and knees bent. They were said to not let their knees buckle inward. Make it a full jump and synchronize their timing with their teammate as they jump and land. They were said to do two sets.



Fig. 9 Running – shoulder contact

RUNNING - QUICK FORWARD & BACKWARD

As a pair, They were said to run quickly to the second set of cones then run backward quickly to the first pair of cones, keeping their hips and knees slightly bent. They were said to repeat the drill, running two cones forward and one cone backward. Taken small and quick steps. They were said to do two sets.



Fig.10 Running-Quick Forward & Backward

PART 2 STRENGTH PLYOMETRICS BALANCE 10 MINUTES THE BENCH - STATIC

Starting Position: They were said to lie on their front, supporting their forearms and feet. Their elbows should be directly under their shoulders.

Exercise: They were said to lift their body up, supported on their forearms. Pull their stomach in and hold the position for 20-30 seconds. Their body should be in a straight line. Try not to sway or arch their back. Done for three sets.



Fig. 11 The Bench static

SIDEWAYS BENCH – STATIC

Starting Position: The players were said to side with the knee of their lowermost leg bent to 90 degrees. Support their upper body by resting on their forearm and knee. The elbow of their supporting arm should be directly under their shoulder.

Exercise: They were said to lift their uppermost leg and hips until their shoulder, hip and knee were in a straight line. Hold the position for 20-30 sec. Took a short break, change sides and repeat. This was done for three sets on each side.



Fig. 12 Sideways Bench-Static

HAMSTRINGS - BEGINNER

Starting Position: The players were said to kneel on a soft surface. Ask their partner to firmly hold down their ankles.

Exercise: Their body should be completely straight from the shoulder to the knee throughout the exercise. Lean forward as far as they can, controlling the movement with their hamstrings and gluteal muscles. When they can no longer hold the position, gently put weight on their hands, falling into a push-up position.

Complete a minimum of 3-5 repetitions and/or 60 sec. Done for one set.



Fig. 13 Hamstrings Benginner

SINGLE-LEG STANCE - HOLD THE BALL

Starting Position: Stand on one leg.

Exercise : The player were said to balance on one leg while holding the ball with both hands. They were kept their weight on the ball of their foot. Remember: Try not to let their knees buckle inward. Hold for 30 sec. Change legs and repeat. The exercise were made more difficult by passing the ball around their waist and/or under their other knee. Done for two sets.



Fig. 14 Single – Leg Stance-Hold Ball

SQUATS - WITH TOE RAISE

Starting Position: The players were said to stand with their feet hip-width apart. Place their hands on their hip.

Exercise: The players were said to perform squats by bending their hips and knees 90 degrees. Do not let their knees buckle inward. Descend slowly then straighten up more quickly. When their legs are completely straight, stand on their toes then slowly lower down again. They were said to repeat the exercise for 30 sec. They were said to do it for two sets.



Fig. 4.15 Squats with Raise

JUMPING - VERTICAL JUMPS

Starting Position: They were said to stand with their feet hip-width apart and to place their hands on their hip.

Exercise: They were asked to bend their legs slowly until their knees are flexed to approx. 90 degrees and hold for 2 sec. They were said to not let their knees buckle inward. From the squat position, jump up as high as they can. Land softly on the balls of their feet with their hips and knees slightly bent. Repeat the exercise for 30 sec. Done for two sets.



Fig. 4.16 Jumping vertical jumps

PART 3 RUNNING EXERCISES 2 MINUTES RUNNING - ACROSS THE PITCH

The players were said to run across the pitch, from one side to the other, at 75-80% maximum pace. Done for two sets.



Fig. 4.17 Running across the pitch

RUNNING – BOUNDING

The players were said to run with high bounding steps with a high knee lift, landing gently on the ball of their foot. Use an exaggerated arm swing for each step (opposite arm and leg). Try not to let their leading leg cross the midline of their body or let their knees buckle inward. Repeat the exercise until they reach the other side of the pitch, then jog back to recover. Done for two sets.



Fig. 18 Running Bounding

RUNNING - PLANT & CUT

The players were said to jog 4-5 steps then plant on the outside leg and cut to change direction. Accelerate and sprint 5-7 steps at high speed (80- 90% maximum pace) before they decelerate and done a new plant and cut. Do not let their knee buckle inward. Repeat the exercise until they reach the other side, then jog back.

Done for two sets.



Fig. 19 Running plant & Cut

RESULT

Comparison of the and Post Test Scores of the two groups

Statistical tool used is the two-sample t test.

Comparison of the Post Score of the two groups

Table 1: Two sample t test table

Post Scores	Number	Mean	S.D	Value of t statistic	d.f	Significance
Group A	30	1.47	0.63	7.282	58	0.000 Significant
Group B	30	0.40	0.50			

Conclusion: Here the value of t statistic (calculated value) is 7.282 and the corresponding tabled value with significance level 0.05(5 percent) and degrees of freedom 58 are 2. That is the calculated value is greater than the tabled value. This means that the post scores are significant at 5% level. Hence we reject the null hypothesis. That is, there is a significant difference between the post scores of the two groups at 5% level of significance.

Here the P-value for the t test is 0.000, which is obtained using SPSS. If the P-value is less than 0.05 we reject the null hypothesis. Otherwise accept the null hypothesis. Here the P-value is 0.000, which is less than 0.05. Hence the study is significant at 5% significance level. So we reject the null hypothesis. That is, there is a significant difference between the post values of the control group and the experimental group.

The mean of the number of injuries to the football players in the control group is 1.47 with a standard deviation of 0.63. Which means that there are 1.47 injuries are happened in the football players in the control group in an average. Also the mean of injuries to the football players in the experimental group is 0.40 with a standard deviation 0.50. Which means that there are 0.40 injuries are happened in the football players in the experimental group in an average. From these two values we can conclude that the chance of occurrence of injury is higher in control group and very less in the experiment group. That is experimental group is better while compare to the average occurrence of the injury.

Table.2: Frequency Distribution of age of two groups

Age		Frequency	Percentage
Group A	10-20	13	43.33
	20-30	17	56.67
	Total	30	100
Group B	10-20	12	40
	20-30	18	60
	Total	30	100

Fig. 1: Gender distribution in control and experiment group

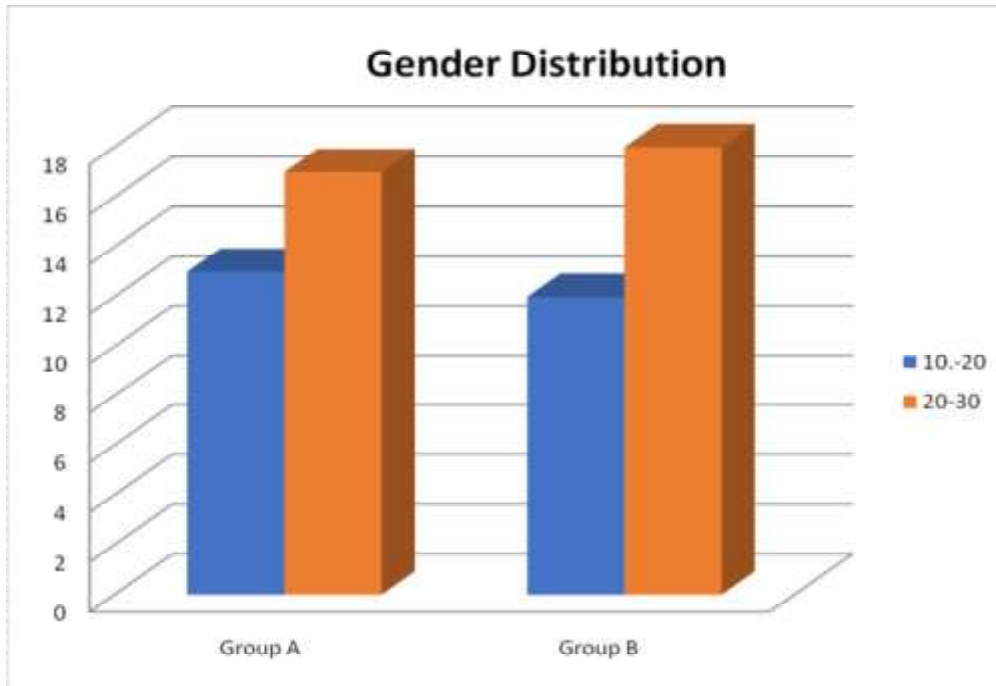


Table 3: Number of injuries in control and experimental group

Injuries	Control Group	Experimental Group
No Injury	-	18
Single Injury	18	12
Twice Injury	10	-
Thrice Injury	2	-
Total	30	30

Fig.2: Percentage of injuries in the Control Group

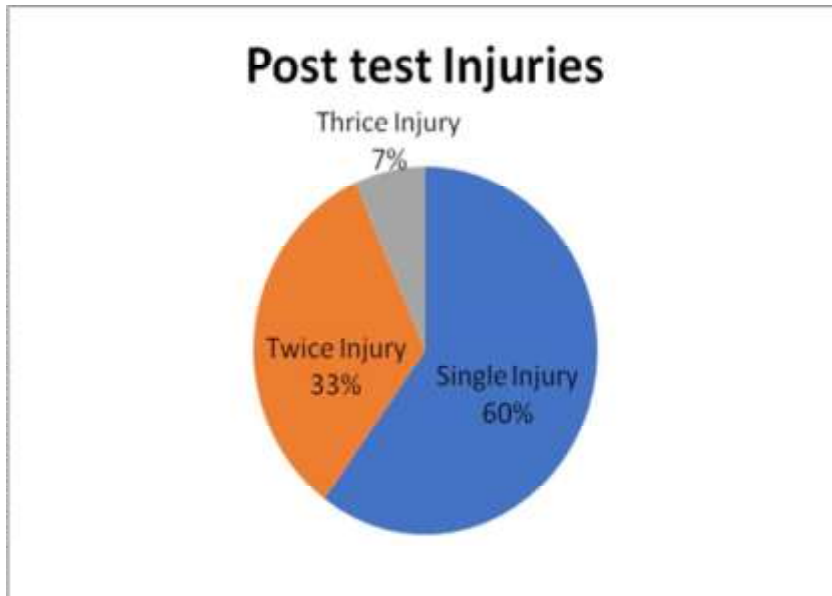


Fig. 5.3 : Percentage of injuries in the Control Group

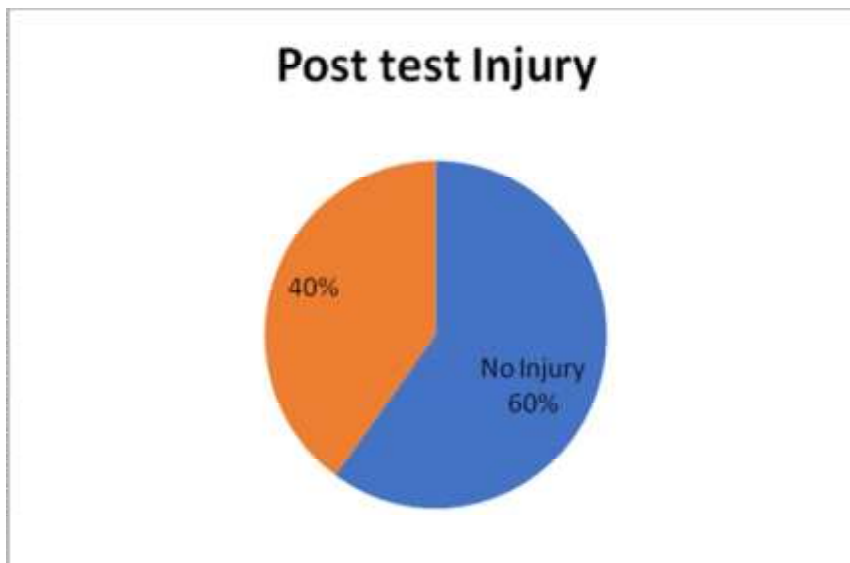


Table 5.4: Frequency Distribution of number of injuries based on site of the Control Group

CONTROL GROUP POST F-MARC TEST SCORES	Scores	Percentage
Head/ face (concussion without loss of consciousness)	3	0.1
knee sprain	12	0.4
Ankle sprain	7	0.233
Ankle sprain ligamentous rupture without instability	4	0.133

Hamstring strain	10	0.333
lower leg contusion	8	0.2666
injury caused by trauma	30	
injury caused by overuse	14	
training injury	4	
match injury	40	
contact injury	27	

Table 5.5: frequency distribution of number of injuries based on site of the Experiment Group

EXPERIMENTAL GROUP POST F-MARC TEST SCORES	Scores	Percentage
Head/ face (concussion without loss of consciousness)	0	Nil
knee sprain	4	0.133
Ankle sprain	3	0.1
Ankle sprain ligamentous rupture without instability	1	0.333
Hamstring strain	2	0.666
lower leg contusion	2	0.66
injury caused by trauma	8	8
injury caused by overuse	4	4

training injury	2	2
match injury	13	13
contact injury	9	9

DISCUSSION

The study aims to find out the effectiveness of FIFA 11+ warm up protocol in preventing injuries among intermediate football players in Kerala.

60 subjects who fulfilled the inclusion criteria was selected and divided into two groups of 30 each as control group (group A) and experimental group (group B) using simple random sampling. A brief explanation about the procedure was given to the subjects and a written consent form was obtained from each of the subjects. The experimental group subjects were treated with FIFA 11+ warm up protocol along with conventional warm up protocol. (Running exercises -2minutes, Strength and Plyometrics -8minutes. Balance-10minutes) and the control group subjects were undergone conventional warm up protocol only for 5 session per week for 3 weeks with one session per day. Pre-test and post-test values were collected using as F-MARC Questionnaire for the documentation of injuries. Pre-test and Post- test data were analysed using independent and paired T test as statistical tool.

The results of this present study indicated that the FIFA 11+ warm up protocol on injury prevention resulted in significant reduction of injuries as indicated by FMARC scores.

Here the value of t statistic (calculated value) is 7.282 and the corresponding tabled value with significance level 0.05(5 percent) and degrees of freedom 58 are 2. That is the calculated value is greater than the tabled value. This means that the post scores are significant at 5% level. Hence, we reject the null hypothesis. That is, there is a significant difference between the post scores of the two groups at 5% level of significance.

Here the P-value for the t test is 0.000, which is obtained using SPSS. If the Pvalue is less than 0.05 we reject the null hypothesis. Otherwise accept the null hypothesis. Here the P-value is 0.000, which is less than 0.05. Hence the study is significant at 5% significance level. So, we reject the null hypothesis. That is, there is a significant difference between the post values of the controlled group and the experimental group.

The mean of the number of injuries to the football players in the control group is 1.47 with a standard deviation of 0.63. Which means that there are 1.47 injuries are happened in the football players in the control group in an average. Also, the mean of injuries to the football players in the experimental group is 0.40 with a standard deviation 0.50. Which means that there are 0.40 injuries are happened in the football players in the experimental group in an average. From these two values we can conclude that the chance of occurrence of injury is higher in control group and very less in the experimental group. That is experimental group is better while compare to the average occurrence of the injury.

The result of the study is in accordance with the Mario Bizzini et al (2013) found that —FIFA 11 +I, in addition to being potentially effective for reducing the risk of injuries, are also adequate for inducing positive acute physiological responses that can enhance the following performance. Owuoye et al. Studied Nigerian players aged 14–19 years (n = 416, IG: 212, CG: 204) for 6 months and found that the FIFA 11+ program was effective, with a global injury reduction rate of 41% (RR, 0.59; 95% CI, 0.40–0.86; p = 0.006) during the evaluation period. David Sadigursky et al (2017) concluded that the FIFA 11+ warm-up program reduced the risk of injury in soccer players by 30%. The result of the study is in according with Sotirios Arsenis et al, (2020) the study concluded that the application of the FIFA 11+ injury

prevention program for 8 weeks can improve lower limbs balance ability and hamstring muscle strength, elements which are very important for prevention of hamstring muscle strains and lower limb ligament injuries in soccer. In the study there is a significant difference between the FIFA 11+ warm up protocol and control group which is used in the own warm up protocol. The similar results were seen in the studies done by Olsen O.E et al, that stated that substantial decrease in the rate of injuries as a result of a similar structured warm up programme and Holly Silvers-Granelli et al (2015) identified that the FIFA 11+ significantly reduced injury rates by 46.1% and decreased time loss to injury by 28.6% in the competitive male collegiate soccer player.

Soligard et al and Steffen et al identified that there is significant reduction (up to 50%) of injuries in female players aged 13-18 in a large randomized controlled trial study, when the warm up exercises were performed at least twice in a week. There is also another study done by Reis I et al, stated that the FIFA11+ enhanced performance (better hamstring/quadriceps strength ratios, improved jumping and agility skills) in Portuguese male futsal player.

A study shown by Impellizzeri et al (2013), found that significantly better neuromuscular control (quicker stabilization time of lower extremity and core) in Italian amateur male players after a week of FIFA 11+ practice the result was that after controlling for covariates, significant difference between group differences after the intervention were found for time to stabilization and core-stability. Differences were also found for eccentric and concentric flexors strength at 60° but this difference was only possibly meaningful from a practical point of view. Performing FIFA11+ can improve neuromuscular control. Similar results also done by Daneshjoo. A. et al, stated that performing the FIFA 11+ warm up for an average of 2 months led to enhanced knee strength ratio, as well as superior static / dynamic balance and agility skills in Asia male players. Bizzini et al. reported statistically significant pre-post warm-up improvements in a number of performance variables, including sprint speed, agility, jump performance and balance.

According to Bishop, (2003a) Physiological responses Most of the effects facilitating the performance after the warm-up appear to be temperature-related. An increase in muscle and core temperature can improve performance by increasing the oxygen delivery to muscles (right-shift in the oxyhaemoglobin dissociation curve), stimulating vasodilatation and blood flow, speeding of rate-limiting oxidative reactions, and increasing nerve-conduction rate. Another benefit of warm-up is the increased baseline VO₂ that has been suggested to decrease the anaerobic contribution at the beginning of the following exercises.

While the evaluation of strength adaptations in specific muscle groups has been confined to iso kinetic testing of hamstrings and quadriceps peak torque or peak torque ratios, increases in fluorodeoxy glucose accumulation in the rectus abdominus, erector spinae, gluteus Medius and minimus were reported following the FIFA 11+ indicative of significant activation of these trunk and hip muscles by the program.

The key elements of FIFA11+ injury prevention programmes for football players are core strength, neuromuscular control and balance, eccentric training of the hamstrings, plyometrics and agility. The FIFA 11+ program combines these 3 key elements into a simple 20min warm up that should be implemented prior to training sessions and games. The program is most effective when completed a minimum of two times a week with correct technique. We would suggest that even an abbreviated FIFA 11+ program would be beneficial if a 20 min program is too long.

The exercises lead to a strengthening of the core and leg muscles, and in addition, static, dynamic and reactive neuromuscular control, coordination, balance, agility, jump technique were improved.

The prevention effect of programme has scientifically proved in the study it is simple and does not require appliances equipment, (i.e no extra cost) or specialist knowledge. It is complete warm up programme with different levels. It is efficient as most of the exercises trains several aspects and replace other exercise.

LIMITATIONS OF THE STUDY

- Sample size was very small
- Sample study duration was very short
- Only males were undergone study
- Due to the pandemic of covid 19

FURTHER RECOMMENDATIONS

- Further research can be warranted with more precise assessment tools and technique.

CONCLUSION

The finding of this study shows that subject who undergo the FIFA 11+ warm up programme reduces in the number of injuries whereas the subject that participate on their own protocol of the study does not show any reduction in the rate of injuries. Therefore, FIFA 11+ warm up programme is beneficial in reducing the rate of injuries among the soccer players. According to this study, FIFA 11+ warm up programme should be introduced to all soccer players from the amateur players to the professional players which can be used for the training sessions. The FIFA 11+ warm up programme which may focused to improve awareness and neuromuscular control during standing, running, planting, cutting, jumping, and landing. Some studies are needed to be done to get more specific into the injuries which are occurring commonly to the soccer players without other environmental factors. Positive effects of the programme on contact and severe injuries are encouraging for reducing serious soccer injuries with consistent implementation. There is therefore a need to incorporate the FIFA 11+ programme in the wider soccer community in Kerala and similar settings to reduce the burden of injuries

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