



## Fitness Training for Female Athletes

Smt.Janaki.Hosur

Godutai Doddappa Appa Arts and Commerce

College for Women Kalaburgi

Karnataka State

**Introduction:** - Female game players need high fitness levels as well as technical and tactical skills in order to reach the top. Traditional gym training to build strength power and speed can be a turn off for many female games players. But according to James Marshall, there is another approach – skills based fitness training...

Like their male counterparts, female game players need high fitness levels (strength, power, endurance, agility etc.) in order to reach the top, as well as technical and tactical skills. With limited time to train all these attributes, combining skills and fitness training is not only time-efficient, but also tends to find favour among the players themselves, mainly because many female games players are less comfortable performing traditional strength work in the gym environment and also because skills-based fitness training is often regarded as more 'fun'.

However, many female games players can still benefit from strength training; for example, studies have shown that (due to the differing biomechanics of the female body) the incidence of knee injury in female athletes is 2-8 times greater than in male athletes.

### Warm-ups and injury prevention

Ideally, games players should warm-up in a manner that closely reflects the demands of the activities to follow – i.e. a sport that involves jumping should include jumping in the warm-up, ball games players should use a ball and so on. The warm-up should also be a good time to include a routine that helps improve landing mechanics, thereby reducing the risk of knee injury, because players are fresh.

Another approach is to use balance and ply metrics [**Plyometrics**, also known as "jump training" or a form of exercise that involves rapid and repeated stretching and contracting of the muscles, designed to increase strength.] Training to enhance lower limb mechanics. Many coaches regard skills and fitness training as two completely separate entities.

However the best coaches are able to combine the two into drills and small games that are not only effective, but are also generally regarded as much more 'fun' by female games players! There's also good scientific evidence that this approach is effective in practice.

Female games player coaches who have limited time might be better to ask themselves not whether their team is fit or not, but instead what two or three performance variables are key to success on the pitch and then set about designing some small games to improve them. By combining these with effective warm-up

drills that replicate the demands of the game, coaches can maximise the time spent with the team and make the training much more fun for the players.

## **Strength training for female athletes**

### **The benefits of strength training for young female athletes**

Strength training is an alien and uncomfortable concept for many junior female athletes who are often unaware of the benefits or, if not, are unsure how to begin. The solution, according to James Marshall, is a six-month general preparation programme, which can serve as the perfect introduction. The higher the level at which a sport is played, the better the physical performance parameters such as aerobic power speed, strength and vertical jumping ability.

Many male athletes have some conditioning background and whether this is correct or not, they usually see the benefits of strength training for their sport. However, this is not the case for younger female athletes; by not starting a strength programme early enough, these athletes may not only increase their chance of injury, but also reduce their ability to play as hard as they otherwise could.

One study from 1991 used a pre-season screening test in female college athletes from a variety of sports, and showed that 40% of the 138 athletes studied suffered an injury that season. The authors also found that there was a trend for higher injury rates to be associated with knee flexor or hip extensor imbalances of 15% or more on either side of the body. What coach can afford to lose nearly half of their players through injury in a season? If even only a portion of those injuries could be prevented through correct training, surely that would help the team or squad?

In his book *Track and Field*, Gerhardt Schmolinsky states that the length of the 'foundation training' depends on the age of the athlete, general training background, and on the volume and intensity of workouts. It usually lasts three to four years. 'Build up training' usually starts at the age of 13 or 14, takes about four to six years and should not be completed before the age of 17 or after 22.

It is important to realise that there are no shortcuts. A 17-year-old female athlete who has no prior RT experience should not be doing the same work as a 16-year-old female athlete who has two years' RT experience. Instead, she should again start from the beginning with a foundation programme.

All athletes should ideally have a pre-training musculoskeletal assessment to assess flexibility and strength levels. The major area to look at is possible imbalances between limbs and between muscle groups in flexibility and strength. Strength testing has to be done carefully with novice trainers; setting a lesser weight and then asking the athlete to lift that as many times as possible is safer than an equally as effective as maximal 1-repetition tests. For example, rather than attempt a 1-repetition maximum, you might ask your athlete to back squat with just a 10kg or 20kg bar on the shoulders and see how many times they can do that with good form.

The general preparation phase (GPP) is important to help introduce the athlete to the training environment, develop core and limb strength, to teach safe and effective techniques and also to introduce the training habit. One of the simplest ways of developing strength is to use the athlete's own body weight.

An example of how to organise these body weight circuits would be to do 20 repetitions of each exercise and then move on to the next one, performing all five exercises in a continuous fashion. After each set, rest one minute then repeat. Do five sets in total.

To make the session easier, try fewer repetitions of each exercise, or add 10 seconds rest in between exercises. To make it harder, perform the five sets in a continuous fashion without rest. Even harder would be to do the total repetitions of the first exercise before moving on to doing the total repetitions of the second exercises so 100 press-ups immediately followed by 100 crunches and so on.

These dumbbell circuits are performed in a continuous fashion, with six repetitions of each exercise being performed before moving straight on to the next one. After each set, rest for 90-120 seconds and then repeat. Look to build up to six sets first after which you can look to increase the weight of the dumbbells.

There are literally hundreds of different combinations that can be performed using dumbbells; it's down to the coach to think about the relevant movement patterns and how to incorporate them. Start by thinking of pushing, pulling, squatting, jumping and rotating. Then think about using one or two dumbbells at a time, seated, standing, one leg, two legs and so on. Changing the exercises each session keeps the athlete interested and means that the body has to adapt to a new stimulus each session.

### **Jumping and landing techniques**

Simple jumping and landing techniques can be introduced at this stage – not as lengthy individual sessions, but as part of the warm-up, or as part of the circuits. Training females on landing techniques has been shown to help landing mechanics, which in turn assist in preventing knee injuries.

Concurrently with body weight and dumbbell exercises, you can start to introduce technical barbell work in order to help the athlete gain a sound technique with low loads through repetition over time. This can be done with broom handles or 5, 10 or 20kg bars and should not be fatiguing. It can be done as part of the warm-up or cool-down as a sub-maximal portion of the exercise session.

Training should be performed three to four times a week in the off-season and can be conducted before or after the team training. The sessions should only be 20-30 minutes long, not including the education and demonstration of the exercises. The athletes can do the body circuits and landing techniques at home. I demonstrate and conduct a session with the athletes first, then get them to practice at home, then review it the following week.

### **The longer term**

Once an athlete has been training regularly for six months, skill level, confidence and fitness will be improved. However, in the words of Arnold Schwarzenegger, this is not the time to 'lift heavy'. Instead, the variety and intensity of the exercises must be developed. Some coaches recommend that an athlete should use strength-specific exercises and exercises with a barbell, such as barbell squats, only after three years of preliminary general preparation.

The use of multiple sets can be more effective in developing strength initially, and in female tennis players the use of periodised training routines that vary the load and volume of the weights during the course of the week has been shown to be more beneficial than keeping them the same from session to session, base that will reduce the chances of injury and help them perform more effectively in competition.

### **Skills Based Training: Female Games Players**

#### **Skills Based Training as an Alternative to Traditional Strength Training**

#### **Skill-based fitness training for female games players**

Strength, power and speed are just as important for female as for male games players, yet many females are uncomfortable in the traditional strength-training environment. The answer, according to James Marshall, could be skill-based fitness training

Female games players in sports such as soccer, rugby, tennis, netball, hockey and lacrosse, who wish to perform at a high standard, need high levels of fitness. Aerobic capacity, power, speed, agility and strength are all required in varying degrees to enable players to excel at these sports. Technical and tactical skills also play a major role in games players' success; a team sport player has to work on the interactions with their team-mates as well as his or her individual skills.

With coaches having limited time to access their players, and with a host of things to work on, combining skill training with fitness training seems an ideal way to maximise contact time with the players. This is commonplace practice in male soccer and rugby league environments.

However, female games players are slightly different for two reasons; firstly, many female athletes are uncomfortable in the strength-training environment, because they regard it as more of a 'male' mode of training; secondly, the female body is obviously different from the male – specifically the biomechanics of the lower limb can make females more susceptible to lower limb injuries (females are 2-8 times more likely than males to suffer knee injuries).

In order to provide a positive environment that encourages female games players to improve their fitness and also reduce their risk of injury, integrating skills and fitness sessions could be beneficial. This article looks at creating an injury prevention-based warm-up, and then at the research on skill-based conditioning games and how to apply them. Although strength training for female games players is not addressed here, the need for an adequate strength base before starting speed or power training cannot be emphasised enough.

### **Incorporating injury prevention exercises into the warm-up**

Warm-ups in team training environments should be used to prepare the players for the activities to follow. If the sport requires jumping, then jumps should be included, sprinting requires sprint drills, contact sports require contact etc. Where possible, a ball should be involved for ball sports, and game-related drills performed so that the players can then get warm physically, technically and mentally.

This may also be the ideal time to introduce a basic routine that helps players develop better landing mechanics in order to prevent anterior cruciate ligament (ACL) injuries. [ACL means A ligament in the knee that crosses from the underside of the femur (the thigh bone) to the top of the tibia (the bigger bone in the lower leg)]. The players are fresh, the progression is suitable for warm-ups and they are supervised. The ACL is at significantly higher risk of injury in females than males. When looking at non-contact injuries, the factors are either internal (joint laxity, hormonal differences, ligament size and femoral notch width) or external (landing mechanics, muscular strength, level of competition, muscle recruitment activities), with landing mechanics being responsible for many of these differences.

### **Conclusions**

If you are a coach of a female team, and you want to improve skills, fitness and prevent injuries, but have limited time with your athletes, what can you do? Well, what gets measured gets done; instead of subjectively assessing whether your team is fit or not, why not take two or three variables that you think are key to winning matches and measure them? Then design some games that incorporate skills but utilise the physical parameters that you want to improve.

For example, speed, agility and aerobic power are useful in soccer. Using games that require sudden changes of direction, both planned and unplanned, could help improve agility. Smaller-sided games, such as 2- or 3-a-side in a slightly bigger area but for shorter times, will help produce the same effect as high-intensity interval training. Use HRMs to help determine the exact effect a drill is having. Conversely, a skill game that has a maximal speed component, but higher amounts of rest, will not improve aerobic capacity, but should help speed performance. From experience, players like these games, because they don't realise they are tired until they are over. By combining effective warm-up drills, skills training and conditioning games you will maximise the time you have with your team and hopefully make training a lot more fun.

1 Menstrual problems in athletes

2. Increased awareness of the dangers of the female athlete triad among medical staff, coaches and athletes; Fear of injury risk as a result of bone loss, motivating athletes with menstrual problems to either increase

their energy intake – lack of energy being thought to be the main cause of MD – or seek help at an earlier stage;

3. Increased use of oral contraceptives to regulate athletes' menstrual cycles and prevent bone loss and injuries.
4. Coaching in small groups of up to six athletes is also beneficial in that it allows for more individual tuition and creates a less intimidating atmosphere in which to facilitate learning.
5. Role models have been shown to be important in increasing participation by women in sport. And if coaches can involve other female athletes, even from different sports, in implementing and demonstrating weight-training techniques, their own athletes may be more likely to respond.
6. A balance needs to be struck between repetition (to promote familiarity and confidence) and variety (to stimulate minds and bodies). One way to do this is by varying the training environment. For example, aqua-based plyometrics can be used as an alternative to land based exercises
7. This will provide a fresh physical and mental stimulus, may be perceived as fun, and is less likely to result in muscle soreness than land based training.
8. Coaches can use this information to educate their athletes, provide them with short, medium and long-term goals, and create a positive, supportive atmosphere in the weight training facility that helps build confidence.
9. strength training leads to improved fitness parameters that help sporting performance, an increase in fat-free mass, a decrease in fat mass and an increase in BMD that will help prevent osteoporosis, what can coaches do to promote participation by female athletes?
- 10 By combining effective warm-up drills, skills training and conditioning games you will maximise the time you have with your team and hopefully make training a lot more fun.

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