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Research Article

PREVALENCE OF ANKLE INSTABILITY IN GYMNASTIC PLAYERS OF AGE BELOW 16 YEAR OLD FEMALE

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ABSTRACT

Aim of Study: To find out prevalence of ankle instability in gymnastic players of age below 16-year-old female
Objectives: 1) To find out the commonest direction of instability using Star excursion balance test. 2) To find out ankle instability using Idfai (Identification of Functional Ankle Instability)
Conclusion: The study concludes that there is significant prevalence of ankle instability in gymnastic player of age below 16 years old female

INTRODUCTION

Gymnastics are an established far of the sports as well as the entertainment industry, with enormous opportunity and rewards nationally as well as internationally. Gymnastics is a sport involving the performance of exercises requiring physical strength, flexibility, power, agility, coordination, and balance. It typically involves the women's events of uneven bars, balance beam, floor exercise, and vault.

Gymnastics evolved from exercises used by the ancient Greeks that included skills for mounting and dismounting a horse, and from circus performance skills. Other gymnastic disciplines include: rhythmic gymnastics, trampolining, Team Gym, tumbling, aerobic gymnastics and acrobatic gymnastics. Participants can include children as young as 20 months old doing kindergym and children's gymnastics, recreational gymnasts of ages 5 and up, competitive gymnasts at varying levels of skill, and world class athletes

Gymnastics is a competitive and popular sport that is started at an early age, and elite female gymnasts reach their prime in mid-teenage years. The level of intensity of practice and competition, the number of events, and the degree of difficulty of the manoeuvers make gymnastics one of the most injury-producing sports[1]

The Fundamental Athletic position in most land-based sports requires the athlete to assume a medium stance with the hips back, and the chest and head aligned with the spinal curves. This posture enables swift movement forward, backward or sideways. It is the basic position assumed for squatting, dead-lifting and executing Olympic lifts. A gymnast assuming the proper position hollows out the chest, pushes the head forward, tucks the hips in and contracts the spine. The only instance when a gymnast takes on the fundamental athletic position is during landings or dismounts. Most gymnastics programmes aggressively cultivate this peculiar posturing in young gymnasts. Strength and conditioning exercises have been geared to develop exactly that training gymnasts in the required stance, thereby generating imbalance. This is a great disadvantage for female gymnasts who are made to forgo upper body conditioning altogether.

As an analogy, consider gymnastics training as jumping off a roof and landing motionless with legs straight. Jump over and over, dozens of times each day, six days a week, over a period of several years. The impact generated by these landings is way beyond the gymnast's body weight. And the higher the altitude of the jump, the more force is involved. Landing mats are a mere token, and seldom help. Floors in gymnasiums act as mini-trampolines, allowing young athletes to soar to ill-recommended heights. Although there are foam pits available to cushion landings, they prevent the athlete from actually learning how to steady their bodies for an actual competition.[2]

Without the needed leg, hip and back conditioning allowing a gymnast to assume the correct position during landing, instead of diffusing, the impact is centered into the joints and bones. This is the explanation behind the never-ending injuries

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sustained by Elite and lower-ranked gymnasts. Most of these injuries last long into retirement.[3]

Sports injuries are common ranking second highest in terms of injuries and disabilities leading to handicap. Gymnasts must consistently prepare for the rigorous physical and emotional toils that the sport requires. With the complexity of routines, the risk of potential injury increases. Injuries most commonly occur in the ankles, feet, lower back, knees, wrists, and hands, often from overuse or simple stress.

Injuries are rarely severe, but if left untreated they can lead to chronic pain and bone fractures. Each year, more than 86,000 gymnastics-related injuries are treated in hospitals, doctors' offices, clinics, and ambulatory surgery centers.4

Injuries to the foot and ankle are common in gymnastics. Acute injuries are usually sprains which can be minor or more serious. Swelling, bruising and tenderness directly over the bones are signs of a more serious injury. Minor injuries typically have tenderness limited to one side of the joint without significant swelling.

Serious injuries require evaluation by a qualified professional while a return to participation after a minor injury is often possible within a week if there is no pain (or limping) with weight bearing activity.

An 80% recurrence rate of ankle injuries has been reported (Smith and Reischl, 1986; Denegar and Miller, 2002).

Twenty percent of patients with acute ligament sprain will complain of residual symptoms after the observation of normal healing time for the mechanical insult to the tissue, which will predispose them to future injury.

This can be attributed to continued joint dysfunction, pre-existing anatomical, and biomechanical factors or inadequate rehabilitation (Denegar and Miller, 2002; Aiken *et al*, 2008; Sankey *et al*, 2008; Liu and Jason, 1994; Mohammad, 2007)

Ankle instability is usually caused by an ankle sprain that has not healed properly. During a sprain, the ligaments in your ankle may have been stretched or torn, and when they healed it resulted in weaker and "stretched out" ligaments

The most common cause for a persistently painful ankle is incomplete healing after an ankle sprain. When you sprain your ankle, the connecting tissue (ligament) between the bones is stretched or torn.

Without thorough and complete rehabilitation, the ligament or surrounding muscles may remain weak, resulting in recurrent instability. As a result, you may experience additional ankle injuries.

Three different kinds of testing of ankle instability are reported in the literature namely perceived, mechanical and functional tests to determine stability (Denegar and Miller, 2002; Nyssa *et al*, 2003; Susco *et al*, 2004; Olmsted *et al*, 2002;Trojian and McKeag, 1998).

Perceived ankle instability is the subjective self-evaluation of the player with regards to ankle function and is established by using questionnaires (Olerud and Molander, 1984).

Mechanical instability, is the increase in accessory movement (arthrokinematic motion that cannot voluntarily be produced e.g. the glide and roll of the talus in the mortise) which translates into an enlarged neutral zone (Panjabi, 1992). The neutral zone can be defined as the area of minimal internal resistance to the joint excursion, supplied by collagen tissue. Mechanical instability is usually the result of a tear or lengthening of one of the ligamentous structures supporting the joint.

Residual mechanical instability suggests a non-optimal healing process, which in turn could lead to functional ankle instability (Denegar and Miller, 2002).

Functional ankle instability together with mechanical instability are the precursors to chronic ankle instability which is caused by recurrent disruptions of the ankle integrity with resultant perceived and observed instability or a combination of these (Denegar and Miller, 2002).

A recent definition of functional ankle instability is the occurrence of recurrent injuries and the sensation of joint instability due to the contribution of proprioceptive, neuromuscular and postural control deficits (Hertel, 2002).

It is suggested that functional instability can be present without any mechanical deficits (Gribble *et al*, 2004).

With the high incidence, prevalence and recurrence of ankle injuries it has been reported that even though the mechanical integrity of the ligamentous structures are accounted for athletes are vulnerable to re-injury and this is classified as functional ankle instability referring to joint motion beyond voluntary control but within physiological constraints, again referring to larger excursion greater than the neutral zone with or without mechanical deficits (Tropp, 1986).

The continuum of stability leads to the intermittent feeling of giving way, difficult to perform on uneven surfaces with resultant mental and physical distrust of the integrity of the ankle (De Norhona *et al*, 2008; Denegar and Miller, 2002).

Aim of Study

To find out prevalence of ankle instability in gymnastic players of age below 16-year-old female

Objectives

1. To find out the commonest direction of instability using Star excursion balance test.
2. To find out ankle instability using Idfai(Identification Of Functional Ankle Instability)

Need of Study

There is no specific literature reporting on the prevalence of ankle instability in gymnastic players. The other factor is evident is that is injury can lead to recurrence which sets up the continuum for chronic ankle instability.

This study set out to establish a prevalence of ankle injuries in gymnastic players and to describe clinical factor relating to ankle injuries. The information derived from this study will serve to assist in setting up an assessment protocol and management strategies to effectively manage these injuries in future.

It will also make the gymnastic players aware of the prevalence of these injuries and what effect it has on the players. Identifying risk factors for injury and implementation preventative measures is becoming increasingly important for the professional sports PPERS person.

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METHODOLOGY

Type of study: Observational Study
Location: Gymnastic school
Duration: 3 Months
Sample Size: 80

Inclusion Criteria

All players in the squad for the first team were included in the study provided none had any of the exclusion criteria listed below.

1. 1 Age: Below 16 years
2. Gender: Female
3. Playing since > 3 months

Exclusion Criteria

Previous surgery to the lateral ankle ligament complex or ankle joint Previous injury (within three months of the test) of the lower extremity rendering the player out of active participation and therefore not currently playing Patients with recently diagnosed concussion (within 1 months of the test)

Patients with an ear infection, head cold or upper respiratory tract infection at the time of study because this could affect the player's ability to balance.

Material: Star Excursion Balance Test

Persons.

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Materials: Star Excursion Balance Test

Study procedure

Procedure

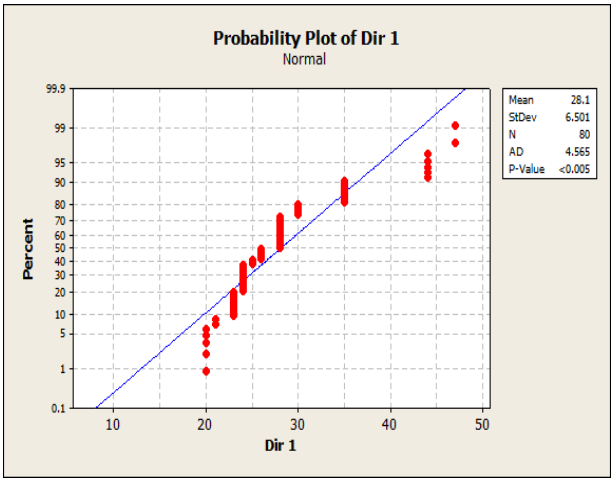
80 gymnastic players who are below 16 years of age, from a gymnastic school were selected as the subject for the study, by using convenience sampling method. Prior starting the study, a written informed consent was taken of each subject. After gaining the consent of the subject the practice session of star excursion balance test was given to each subject and then the star excursion test was performed for both the lower limbs.

The data collected was then statistically analyzed and the results were prepared.

RESULTS AND TABLES

Demographic Data

Age	10.887
Since they are playing	23.65 months
Identification of ankle instability (IdFAI)	3.125



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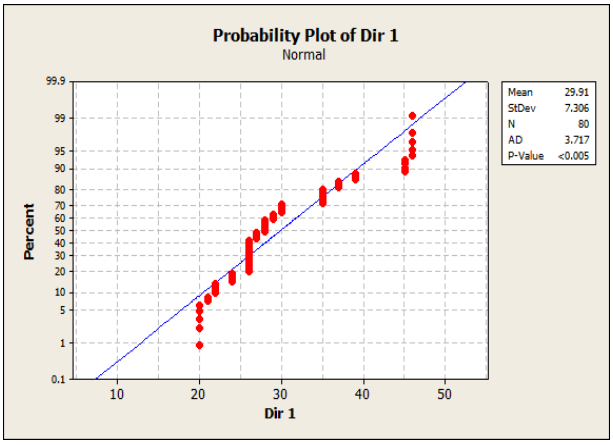

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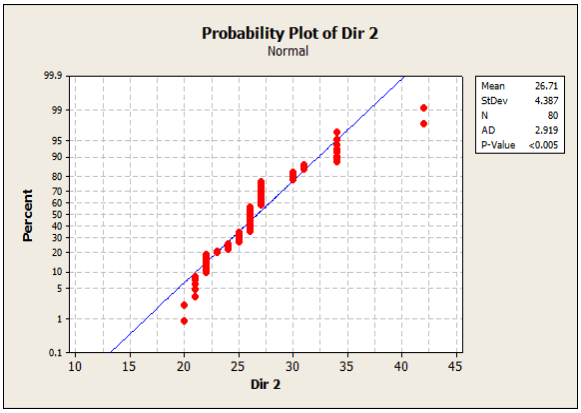

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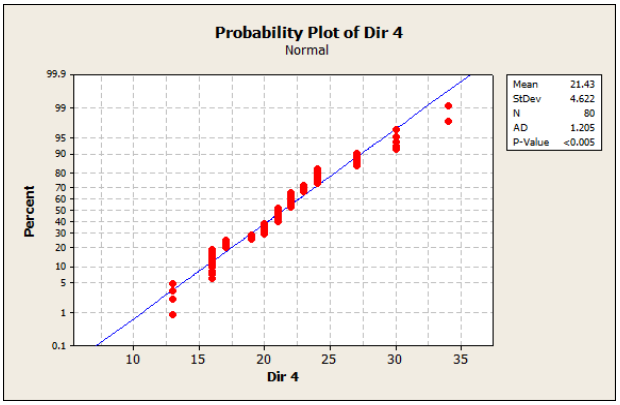

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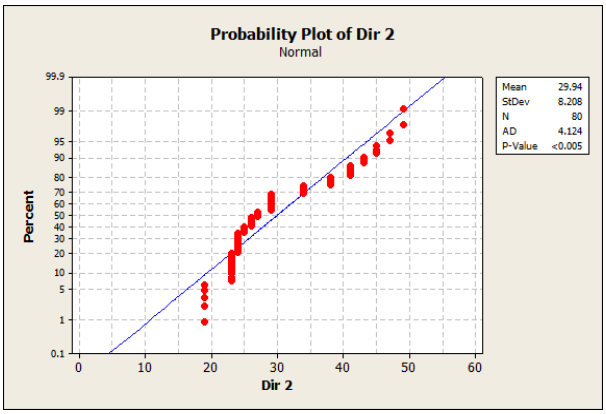

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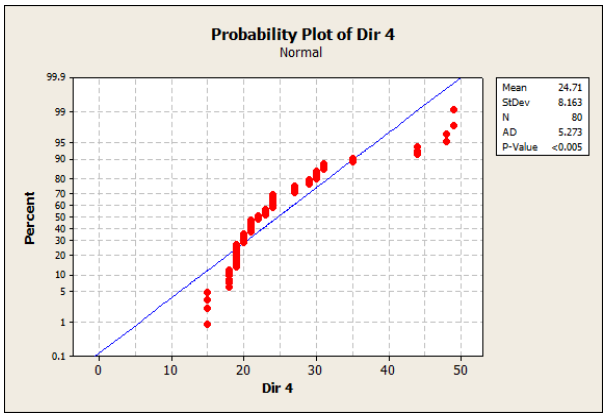

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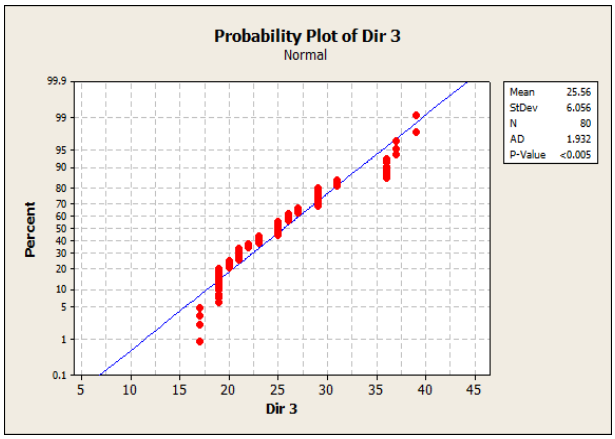

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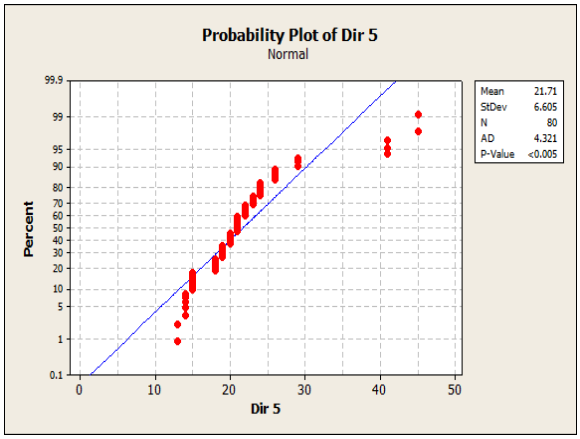

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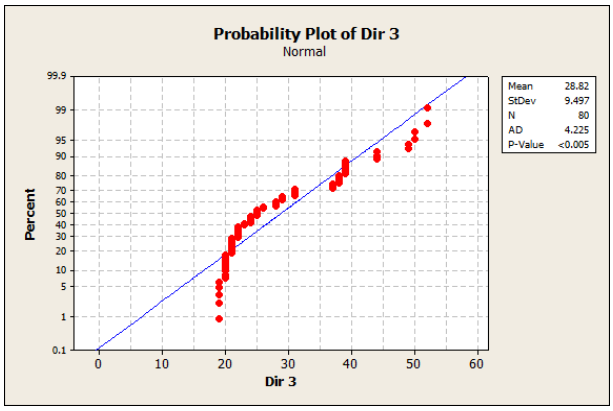

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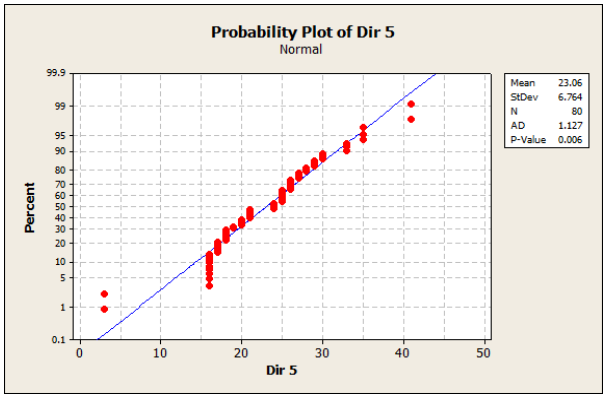

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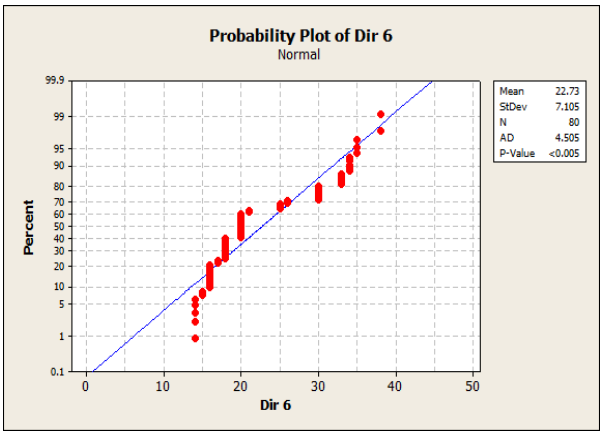

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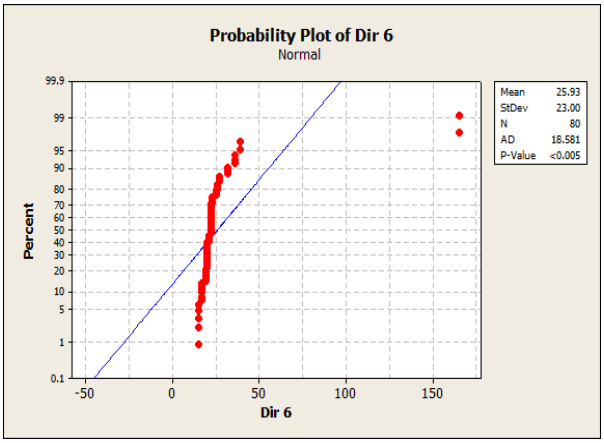

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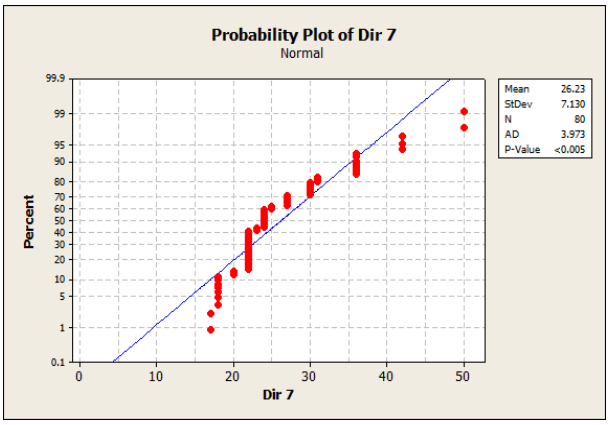

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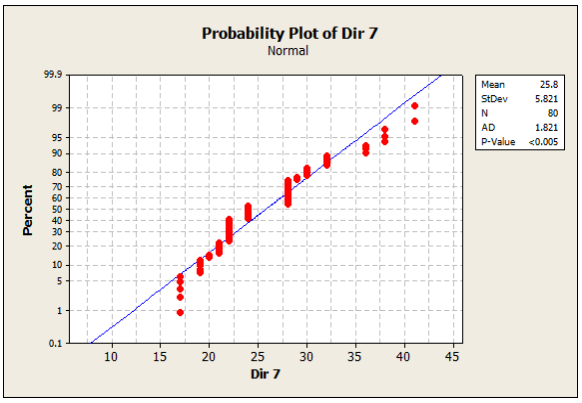

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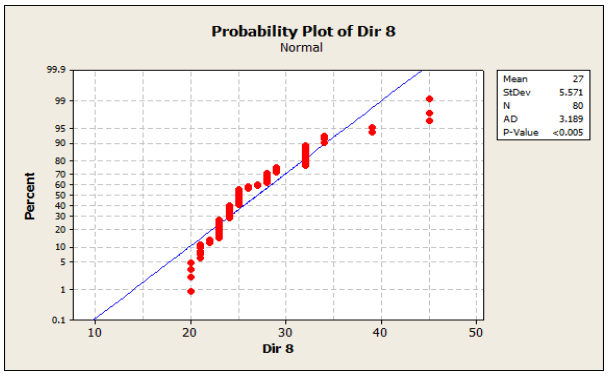

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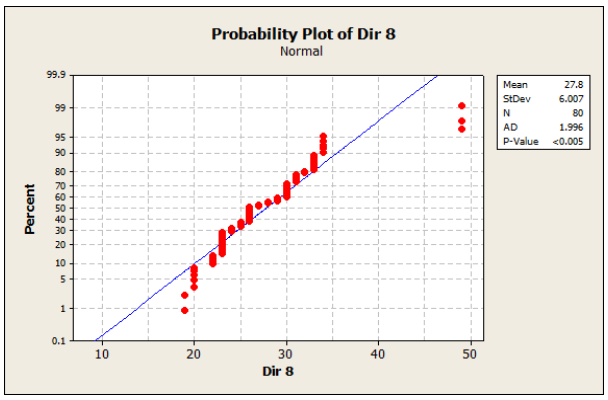

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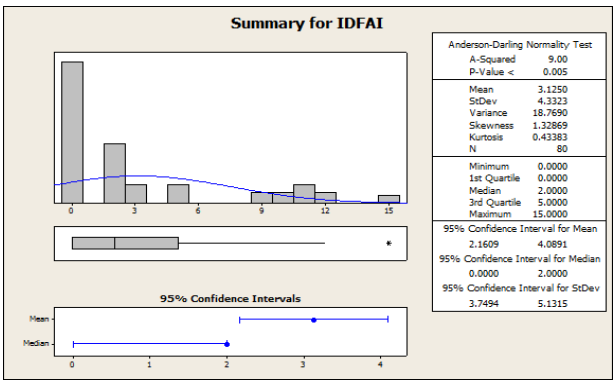

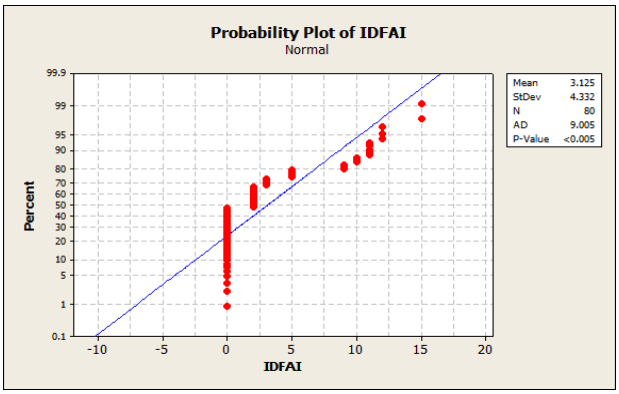

CONCLUSION

The study concludes that there is the significant prevalence of ankle instability in a gymnastic player of age below 16 years old female.

Limitations

The ankle range of motion was not taken into consideration in this study

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