ASSESSMENT OF SPORT INJURY PREVALENCE AND RADIOLOGICAL DIAGNOSTIC EXAMINATION PRACTICES AMONG MALE FOOTBALLERS IN BENIN METROPOLIS

BY

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CERTIFICATION

This is to certify that the research work for this project and the subsequent write up by Martins Praise Tochukwu, with matriculation number BMS2005195 were carried out under my supervision.

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	(Signature and Date)

DEDICATION

I dedicate this research project to my beloved parents, who instilled in me the desire to work hard and excel and supported me morally and financially.

ACKNOWLEDGMENT

All gratitude and appreciation to Almighty God who gave me the wisdom, courage, opportunity, and good health to undergo this study.

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My special acknowledgment goes to Mr and Mrs Martins, Thank you Dad and Mum for your unwavering support, prayers, and motivation, which provided me with the emotional and moral strength to persevere.

I promise to always make you proud.I love you both soo much.

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ABSTRACT

Radiographic imaging has become a crucial element in the diagnosis of musculoskeletal injury to direct treatment.

A descriptive cross-sectional study design was used on 105 football players in Benin Metropolis. The structured questionnaire included the data collected concerning the history of injury, imaging use, and radiological service satisfaction. The purposive sampling was employed, and SPSS version 29 was applied to examine the data. The data were summarized using descriptive statistics (frequencies and percentages) and Chi-square tests were used to establish associations at a level of significance of 0.05.

About 97 of 105 players (92.4) said that they had suffered sports related injuries. Ankle 46 (43.8%) and knee 37 (35.2) were most affected with muscles strain 54 (51.4) and sprain 28 (26.7) being key types of injury. The most frequently used imaging modalities were Xray 41 (39.0) and CT 36 (34.3), whereas the MRI and ultrasound were underutilized. The association was significant between age and frequency of injury ($p = 0.011$) and between training frequency and body part affected ($p = 0.000$), not type of injury and the use of imaging ($p = 0.052$). Radiological services also satisfied about 83 (79.0) players, 77 (73.3) played that imaging promoted their recovery process.

Radiographic imaging is helpful in accurate diagnosis, treatment choice, and management outcome in sports related injuries. It is highly suggested that radiographers should be integrated into sports medical teams and greater availability of advanced imaging modalities should also be provided.

Keywords:
Sports trauma, radiological examination, football, computer tomography, and radiologist.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The occurrence of sports injuries is prevalent among athletes because of the physical challenges of training and competitions (Bonab *et al*., 2023). The dominating factors that contribute to these injuries include high intensity activities and regular contacts between the players (Ogbonnaya *et al*., 2021). Sports injuries, both acute and chronic, are usually associated with the soft tissues, that is, muscles, ligaments, and tendons (Drews and Mauch, 2017).

The statistics of British Olympic athletes indicate that 67 percent of the training disruptions are due to injuries and 43 percent of participants at least one dislocation annually (Bonab *et al*., 2023). Nigeria has the largest amount of both male and female footballers with more than 6.5 million people playing at different levels (Owoeye *et al*., 2017).

The issue of injuries is significant in the context of major tournaments, where a lack of time due to tight schedules does not allow much time to treat those (Bordalo *et al*., 2025). The injuries among football players especially those of school-going age occur high all over the world because of pressure to perform and the desire to become a professional football player (Ogbonnaya *et al*., 2021). The majority of such injuries involve the lower limbs, which can be knees and ankles in the majority of cases, and these are usually sprains and strains, contusions, or fractures (Ogbonnaya *et al*., 2021). Medical imaging has a role in the diagnosis, severity evaluation, and rehabilitation in the planning of injured athletes in the early stages (Jyoti *et al*., 2020). Among all

sports related injuries, muscle injuries are difficult for professional athletes as they comprise almost one-third of all such injuries (Guermazi *et al*., 2017). Proper diagnosis and prognosis are improtant issues, and magnetic resonance imaging (MRI) and ultrasound (US) are the focal points of the process (Bonab *et al*., 2023).

The application of ultrasound in sports medicine has been established long ago to assess the musculoskeletal injury of the subcutaneous tissues, fascia, muscles, tendons, joints, ligaments, bones and nerves. It has a number of benefits, such as portability, cost effectiveness, patient comfort, and lack of ionising radiation, as well as real-time imaging (Finnoff *et al*., 2016).

Radiography and computed tomography (CT) could be used to identify fractures and soft tissue mineralization, but they are not effective to evaluate acute muscle injuries. In comparison, MRI and ultrasound have a higher soft tissue contrast and spatial resolution and can be used to visualize muscular and connective tissue structures in detail (Flores *et al*., 2018).

Some sports like soccer, American football, hockey, and baseball are related to high occurrence of groin injury which includes athletic pubalgia with groin pain constituting up to 13 percent soccer related injuries (Khan *et al*., 2013). Blunt trauma is an ordinary form of muscle damage especially in contact sports such as soccer and rugby (Guermazi *et al*., 2017).

Such injuries are usually as a result of complicated combination of internal and external risk factors. Therefore, in order to achieve the most significant results, both groups of variables should be under consideration within the framework of injury prevention strategies (Mbada *et al*., 2022).

Nuclear medicine is becoming more common in sports medicine, including bone scintigraphy and leukocyte scintigraphy (Glaudemans *et al*., 2015). The planar bone scintigraphy, single photon emission computed tomography (SPECT)/CT, and positron emission tomography (PET)/CT modalities are beneficial to the diagnosis and treatment of musculoskeletal and orthopedic diseases (Zuziak et al., 2023).

These dynamic imaging methods are able to identify a large number of conditions such as stress fracture, osteonecrosis, and joint injuries. They are also used to detect subtle or occult pathology that would be difficult to detect using conventional imaging methods (Pagou, 2020).

Radiological assistance is not only used in diagnosis but also in real time intervention and management in the competition (Bordalo *et al*., 2025; Humoud *et al*., 2024).

Despite the importance of these modalities, there is limited research on the patterns of sports injuries and the radiological practices involved in their assessment in Benin Metropolis. This study aims the prevalence of sports injuries and the radiological diagnostic practices among male footballers in Benin Metropolis.

1.2 Statement of research problem

Imaging is essential in diagnosing and managing sports injuries (Jyoti et al., 2020). Recent studies consistently highlight the high prevalence and burden of football-related injuries. A 2023 meta-analysis reported an overall injury incidence of 7.75 per 1,000 hours of play, with muscle and tendon injuries accounting for approximately 39.8% of all cases, and 83.3% of injuries affecting the lower extremities (Gurau et al., 2023). In Nigeria, a prevalence rate of 81.6% has been documented (Azubuike & Okojie, 2009).

Although international studies have described injury patterns, imaging utilization, and treatment approaches among elite athletes, evidence from developing countries—especially within local, club-level football systems—remains limited. Existing studies in Nigeria have largely focused on injury prevalence among secondary school athletes or national tournament participants, with minimal emphasis on how radiological investigations are used and how injuries are subsequently treated in football settings.

Despite the large population of active footballers in Benin Metropolis and the increasing burden of musculoskeletal injuries, no documented study has simultaneously examined the prevalence of sports injuries, the radiological diagnostic practices, and the treatment methods used to manage these injuries among professional footballers in this region. This lack of localized data restricts the ability of physicians, radiographers, physiotherapists, club administrators, and policymakers to design targeted injury-prevention programs, optimize imaging pathways, standardize treatment protocols, or improve access to appropriate diagnostic and therapeutic services. Therefore, this study fills a critical gap by providing evidence on sports injury patterns, radiological diagnostic practices, and treatment approaches among male footballers in Benin Metropolis..

1.3 Research questions

i. What are the most common types of sports injuries sustained by registered footballers in Benin Metropolis?
ii. Which anatomical regions are most affected, and what types of radiological diagnostic procedures are used in evaluating sports injuries among these footballers?
iii. How satisfied are registered footballers in Benin Metropolis with the radiological and medical management they receive for sports injuries?

1.3 Research Hypothesis

Null hypothesis: H_0: There is no significant relationship between the type of sports injury sustained and the use of radiological diagnostic imaging among professional footballers in Benin metropolis.

Alternative hypothesis: H_1: There is a significant relationship between the type of sports injury sustained and the use of radiological diagnostic imaging among professional footballers in Benin metropolis.

1.5 Aim of the study

To assess the prevalence of sports injuries and examine radiological diagnostic examination practices among professional male footballers in Benin Metropolis.

Objectives of the study

i. To determine the most common types of sports injuries sustained by registered footballers
ii. To identify the anatomical regions and types of Radiological Diagnostics used in sport injury evaluation
iii. To assess the satisfaction of registered footballers in Benin Metropolis with Radiological and Medical Management

1.6 Significance of the study

This study will provide important data for sports medicine professionals, radiographers, and football club administrators. Footballers will benefit from the study through early and accurate diagnosis, tailored treatment and management plans, reduced risk of re-injury and minimized need for surgeries. However, due to privacy concerns and stigma about fitness to play some players might not feel comfortable to give out personal information with fear of it affecting their career in the future. Radiographers, radiologist and other health care providers will gain exposure to sport injury cases requiring different imaging modalities thereby improving injury characterization and reducing misdiagnosis. The study will help healthcare providers to accurately identify injuries and develop better strategies in managing footballers with sport related injuries. It will also improve injury assessment, recovery monitoring and assist in guiding rehabilitation progress.

1.7 Scope of study

The study was limited to male footballers registered professional football teams within Benin Metropolis. It was focused on sport injuries sustained within the last 2-3 football seasons and the radiological diagnostic services accessed for those injuries.

1.8 Operational terms

Computed Tomography (CT): An imaging modality that uses X-rays to create cross-sectional images.

Cross-sectional study: A type of observational study that analyzes data from a population at a specific point in time.

Diagnosis: The identification of the nature of an illness or injury through imaging and other methods.

Diagnostic Center: A facility focused on imaging and diagnostic services.

Magnetic Resonance Imaging (MRI): It is a non-invasive imaging method that yields three dimensional detailed anatomic images.

Management: This is the procedure of handling or managing a health complication or injury.

Medical imaging: Techniques applied to the treatment and diagnosis of the internal structures of the body.

Radiographer: A medical worker who is trained to carry out medical imaging. Radiography Radiography is an imaging technique that is used to diagnose diseases and injury.

Sports Injury: It is a form of damage caused to the body as a consequence of sporting activities or exercise.

Ultrasound: This is a diagnostic imaging method in which organs and structures are produced using high-frequency sound waves.

X-ray: This is a form of ionizing radiation that is utilized in creation of images of the inner part of the body.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual review

Sports medicine requires accurate imaging to make accurate diagnoses, assessments, and planning of treatment. Magnetic resonance imaging (MRI), ultrasound (US) are the most popular modalities because of their excellent soft tissues contrasting ability. MRI and US can offer a closer look of muscles, tendons, ligaments, and cartilage, and help clinicians plan their treatment and monitor recovery (Flores et al., 2018; Bonab et al., 2023). Table 2.1 indicates the different imaging modalities that are applied in evaluation and management of sport injuries.

2.1.1 Classification of sport injuries

Sports injuries refer to damage sustained by tissues or structures of the body during training, competition, or other physical activity. These injuries can occur as a result of excessive force, sudden impact, inadequate warm up, overuse, or poor biomechanics (Glaudemans *et al*., 2015). In football, athletes frequently make rapid directional changes, collide with opponents, and place repeated stress on the lower limbs. Consequently, injuries to joints, muscles, ligaments, and tendons are common (Drews & Mauch, 2017) (Table 2.1).

Table 2.1: Classification of sport injuries

Musculoskeletal structure	Acute injuries	Overuse injuries
Bone	Fracture, Contusion	Stress reaction/fracture Osteitis/periostitis Apophysitis
Cartilage	(Osteo)chondral lesion, Fibrocartilaginous lesions	Chondropathy, osteoarthritis
Joint	Subluxation, dislocation	Synovitis/capsulitis, Impingement
Ligament	Sprain/tear	Inflammation
Muscle	Strain/tear, Contusion, Myositis ossificans, Exercise-associated muscle cramp (EAMC)	Chronic compartment syndrome, Focal tissue thickening/fibrosis Delayed-onset muscle soreness (DOMS)
Tendon	Tear (partial/complete)	Tendinopathy
Bursa	Traumatic bursitis	Bursitis
Nerve	Neuropraxia	Entrapment

(Glaudemans *et al*., 2015)

Table 2.2: Modalities used for evaluation, management and interventions in sport injuries

Modality	Advantages	Disadvantages	Practical Applications	Other features
X-ray	Fast. Inexpensive. Interpretation Widely available. Good visualization of bone pathology. Lower radiation.	Some radiation. Restricted degree of differentiation for soft tissues. 2D image only.	Use in major trauma. Identification of bone pathology and foreign bodies. Used in OR to guide operation.	Different views can be obtained. Contrast can be given to visualise other structures.
Ultrasound	Fast. Inexpensive. Real-time. Good visualization of soft tissues. No Radiation risk (pregnancy safe).	User dependent. Can't visualize deep tissues and bone. Patient BMI can reduce accuracy.	Can be used on the field to quickly assess injury. Visualise soft tissues like muscles, tendons and organs. Identifies free fluid.	Different probs available. Sonoelastography. Doppler effect. Can be used in fusion imaging
Fluoroscopy	Real-time video. Good visualisation of bones	Expensive. High dose radiation. Less availability.	Can guide injections. Real-time video. Good visualisation of bones. Expensive. High dose radiation. Less availability. Can be used in OR. Can be used to ensure optimum function restoration.	
CT	Fast. 3D image. High resolution. Good visualisation of bone, soft tissues and calcified lesions. Potential for artefact reduction.	Slower than X ray and ultrasound. Highest radiation exposure compared to other modalities. Limited diagnostic value in metal-related artefacts. Can't use it to assess soft tissues adequately.	Use in preoperative planning. CT-guided injections.	Contrast can be used to visualise structures. Arthrography. Real-time radiation monitors used to monitor exposure. Standing CT Spectral CT Can be used in fusion imaging
MRI	Highly detailed visualisation of soft tissues. High spatial resolution. No radiation (pregnancy safe).	Expensive. Time consuming. Not widely accessible. Inability to use with metal artefacts.	Intraoperative MRI guidance. Soft tissue pathologies. Nerve injuries	Multiplanar MRI. Upright MRI. Can be used in fusion imaging
Nuclear Medicine	Shows metabolic activity of tissues.	Use of radioactive materials. Expensive	Detection of metabolic activity. Early detection of bone stress trauma	Skeletal scintigraphy.

(Bonab *et al.*, 2023)

2.1.2 Classification of muscle injury

Muscle injuries make up a significant proportion of sports-related morbidity, especially among footballers who engage in repeated sprinting, kicking, and sudden stops. Estimates suggest that muscle injuries account for roughly one-third of all injuries in high performance athletes (Guermazi *et al*., 2017). These injuries may result from overstretching, fatigue, or direct impact.

Clinically, muscle injuries vary from mild strains to complete ruptures (Table 2.3). Imaging allows clinicians to determine the precise location and severity of injury. MRI and ultrasound, in particular, can show the involvement of the myotendinous junction, degree of fibre disruption, presence of hematoma, and any chronic changes such as fibrosis (Flores *et al*., 2018). This information is essential for estimating recovery time and planning rehabilitation.

Table 2.3: Clinical classification of muscle injury

Presentation	Trauma Mechanism	Injury
Acute	Indirect	Myotendinous junction (MTJ) strain
	Direct	Contusion with acute hemorrhage Laceration
	Related to fascia	Acute compartment syndrome
Delayed/ subacute	Indirect	Delayed-onset muscle soreness (DOMS)
	Direct	Subacute hematoma
Chronic	Indirect	Disordered healing with fibrosis/atrophy
	Direct	Chronic hematoma
	Related to fascia	Chronic exertional compartment syndrome (CECS) Muscle hernia

(Flores *et al.*, 2018).

2.1.3 Role of radiography in sports injury imaging

Radiography remains the most frequently used initial imaging modality in sports medicine because of its accessibility, low cost, and speed. Although it is limited in evaluating soft tissues, it is highly reliable in identifying fractures, dislocations, foreign bodies, and certain bone related abnormalities (Jyoti *et al*., 2020). In football, radiographs are typically requested when an athlete presents with acute trauma, suspected fracture, or joint deformity.

Radiographs may also be used to monitor healing after fractures and to guide certain orthopaedic procedures. However, the modality cannot adequately visualize ligaments, cartilage, or muscle fibres, making further evaluation with CT or MRI necessary when soft tissue damage is suspected (Bonab *et al*., 2023).

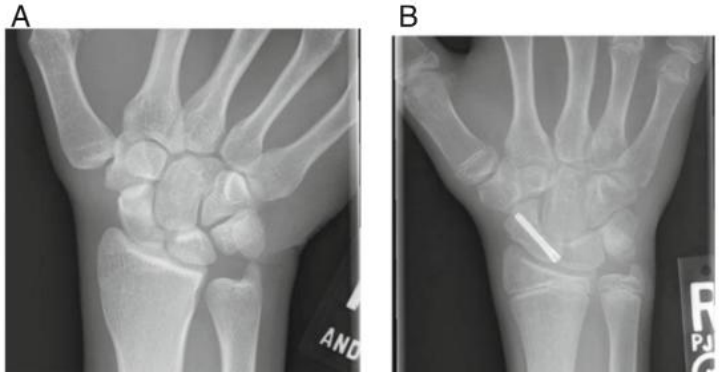

Figure 2.1: **A**. radiograph of a nondisplaced proximal pole scaphoid fracture in a hockey player. **B.** PA radiograph of a nondisplaced scaphoid waist fracture in a high school soccer player treated with headless compression screw fixation
(Avery *et al*., 2016)

2.1.4 Role of ultrasound in sports injury imaging

Ultrasound (US) is increasingly used in sports settings due to its portability, safety profile, and ability to provide real-time dynamic assessment. It is especially suited for superficial soft-tissue injuries, including muscle tears, tendon abnormalities, bursitis, and ligament injuries in accessible regions (Allen & Jacobson, 2021).

In football, ultrasound is valuable for assessing hamstring, quadriceps, or calf injuries, and for identifying joint effusions or tendon pathologies. Doppler techniques can further help evaluate vascularity in cases of inflammation (Bonab *et al*., 2023). Its utility on the field makes it an attractive tool in both competitive and local sports environments.

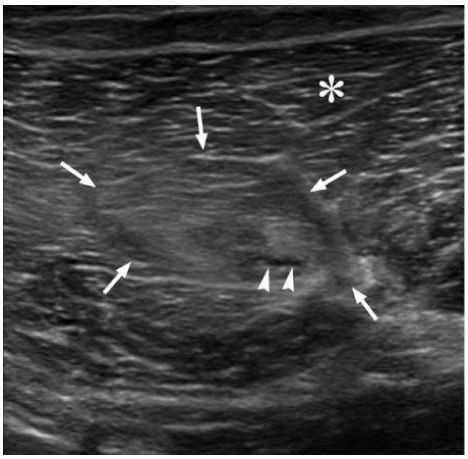

Figure 2.2: Grade 1 injury of the biceps femoris. Transverse sonogram of left thigh shows normal muscle (∗) with a small area of echogenic edematous muscle (arrows) containing a small area of hypoechoic disruption (arrowheads)
(Allen & Jacobson, 2021)

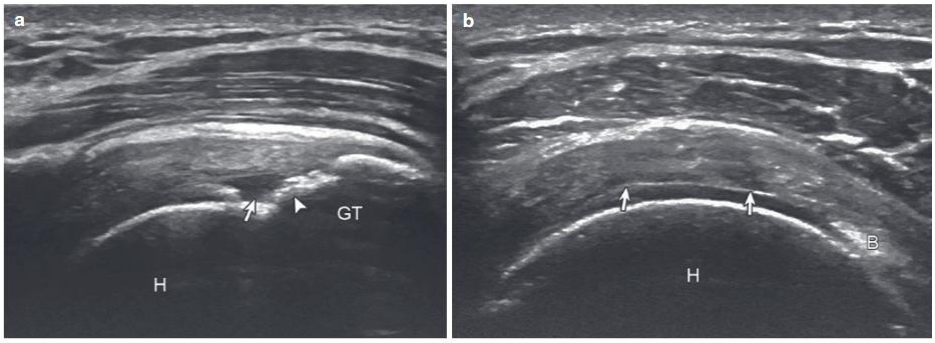

Figure 2.3: Supraspinatus tear: articular side partial thickness

(Allen & Jacobson, 2021)

2.1.5 Computed Tomography (CT) in sports medicine

CT offers high-resolution cross-sectional imaging, particularly useful for complex fractures, calcifications, and injuries involving bony architecture. Although CT exposes patients to higher radiation doses than plain radiography, its diagnostic value in evaluating fractures, joint alignment, and some soft-tissue abnormalities is well recognized (Bonab *et al*., 2023).

Figure 2.4: Lateral knee radiograph (a) and sagittal CT (b) showing avulsion fracture of the tibial tuberosity (arrow). CT: Computed tomography
(Bonab *et al*., 2023).

2.1.6 Magnetic Resonance Imaging (MRI)

MRI is widely considered the gold standard for evaluating soft-tissue injuries. Its ability to reproduce high contrast images without ionizing radiation makes it particularly beneficial in assessing muscles, ligaments, cartilage, tendons, and bone marrow (Guermazi *et al*., 2017). Footballers with suspected ligament tears such as anterior cruciate ligament (ACL) injuries or meniscal damage typically require MRI for definitive assessment.

Advanced techniques such as T2 mapping provide early insights into cartilage degeneration, allowing clinicians to identify changes before symptoms worsen (Bonab *et al*., 2023). Despite its diagnostic value, access to MRI remains limited in many low-resource settings due to cost and availability.

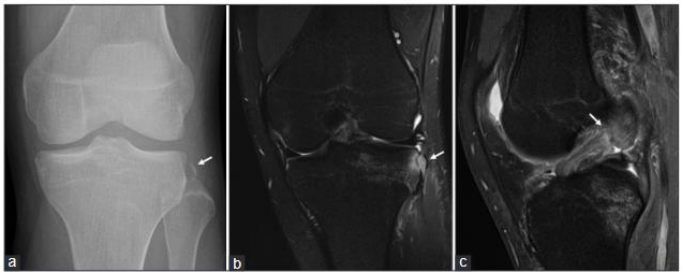

Figure 2.5: AP radiograph (a) of knee showing fracture of the lateral part of the lateral tibial condyle (arrow) Segond fracture. PDFS coronal (b) and sagittal (c) showing Segond fracture (arrow) with tear of ACL (arrow). PDFS: Proton density fat saturated, ACL: Anterior cruciate ligament, AP: Anteroposterior
(Bonab *et al.*, 2023)

2.1.7 Nuclear medicine techniques

Nuclear imaging modalities, including bone scintigraphy and SPECT-CT, are used to assess metabolic activity in tissues. These techniques can detect early stress fractures, osteonecrosis, and enthesopathies even before structural abnormalities appear on radiographs (Pagou, 2020). Although nuclear medicine is not routinely used in everyday sports injuries, it plays an important role in cases where symptoms persist and other imaging modalities yield inconclusive results (Zuziak *et al*., 2023).

2.1.8 Imaging guided interventions in sports injuries

Recent advances have led to increasing use of imaging guided procedures in sports medicine. Ultrasound and CT are frequently used to guide injections such as corticosteroids and platelet rich plasma (PRP), as well as to facilitate minimally invasive treatments for ligament or tendon injuries (Bonab *et al*., 2023). These techniques improve accuracy, reduce complications, and enhance recovery outcomes.

Table 2.4: Types of sport and most common injuries

Sport	Most common injuries
Soccer	Hamstring and quadriceps strain/cramps/contusions
Tennis	Rotator cuff tears, lateral epiconodylitis (“tennis elbow”)
Football	Lateral ankle sprain, ACL tear, ACC joint separation, hamstring strains
Basketball	Ankle sprains, ankle/foot fractures, knee joint injuries
Baseball	Rotator cuff tears, posteromedial elbow impingement
Volleyball	Acute ankle sprain, chronic/overuse knee injuries, shoulder overuse injuries
Rugby	Thoracic cage fractures, lower extremity muscle strains
Cycling	Acute trauma targeting any region (falling or traffic accident), anterior knee injury
Skiing	femoroacetabular impingement, thumb ulnar collateral ligament sprain (skier’s thumb)

(Thierfelder, 2019)

2.2 Empirical review

Bordalo et al. (2025) performed a retrospective study at the 2022 FIFA world cup in Doha in Qatar in order to evaluate musculoskeletal injuries and interventional procedures in players. One hundred and forty-three radiologic tests were administered to 94 players, with the highest frequency of magnetic resonance imaging (MRI) (67%), radiography, ultrasonography, and computed tomography. Their results showed that muscles and tendons (42 percent) were most frequently affected tissues with the dominant anatomical location in the thigh, ankle/foot, and knee. This paper highlights the primary position of MRI in the diagnosis of acute muscle injuries in high level sporting events.

In a prospective study that is related, Bisciotti et al. (2024) focused on 120 athletes who had the groin pain syndrome and was considered to be caused by the inguinal hernia or the weakness of the anterior wall, and they provided a modified MRI protocol designed to examine the pelvis and the pubic area. The results of MRI showed that it has close relations with clinically diagnosed conditions, highlighting the importance of MRI in showing subtle pathologies that are hardly visible using only clinical examination or ultrasound as imaging methods. This confirms the diagnostic superiority of MRI in complicated groin pain conditions.

Lee et al. (2022) evaluated the prognostic value of delayed gadolinium-enhanced magnetic resonance imaging of cartilage (dGEMRIC) in determining cartilage damage and surgical outcomes in patients who underwent periacetabular osteotomy (PAO). The preoperative dGEMRIC values were significantly correlated with intraoperative cartilage damage and cartilage flap. Nonetheless, these values had no

significant correlation with midterm postoperative outcomes. This indicates that dGEMRIC might be useful in preoperative cartilage evaluation, but their extent of predicting long term outcomes is low.

Mbada et al. (2022) used a retrospective study of patterns of injuries at the 24th Nigerian University Games. Out of 159 athletes that were medically interfered with, sprains (50.9 percent) and strains (22.0 percent) were the most common injuries, most of which were lower limb injuries. The commonest treatment was the use of cryotherapy where the most concerned health personnel was the physiotherapists. The paper has pointed out the rate of injury in contact sports, especially football, and during competitions at an early stage.

To improve the diagnosis of sports related tear injury, Nie et al. (2021) suggested a new CT based feature extraction algorithm. The study using wavelet decomposition and mathematical morphology enhanced the edge detection and feature extraction of CT images. The method proved to be useful in the detection of the nature of injury, giving valuable diagnostic information to clinicians and possibly increase the accuracy of diagnosis in CT based testing.

A survey of injury patterns in school-age footballers was conducted by Ogbonnaya et al. (2021) in a Nigeria. The researchers discovered that the prevalence of injuries was high (74.3%), with knee ankle in the first place. The most frequent types of injuries were wounds and muscle sprains. Injury mechanisms were tackles, adverse surrounding conditions in the field, and absence of protective equipment. The prevalence of injuries was considerably associated with the frequency of training and

the use of protective devices which have a significant contribution to the plans of injury prevention.

Ossola et al. (2021) explored the application of ultrasound (US) and MRI in the classification of muscle injuries and the prognosis of the time of return to sport (RTS) in professional soccer players. The results of the study revealed that there were a strong correlation between MRI based grading (Mueller-Wohlfahrt classification) and RTS duration with MRI being more prognostic in comparison to ultrasound. The length of lesion on the imaging was also significantly correlated with recovery time but the location of the lesion did not portend as much.

To identify the epidemiology and risk factors of injuries, Schilders et al. (2021) conducted a 1-year prospective study of 498 adolescent athletes. The greatest rates of injuries were related to soccer (7.21 injuries per 1000 hours) as lumbar strains, ankle sprains, and fractures were the most prevalent. It is worth noting that a large percentage of the injuries happened in regions where history of injuries has been recorded before, implying the need to employ specific prevention and recovery efforts.

The article by Prieto-Gonzalez et al. (2021) conducted a review of MRI in athletes who had acute traumatic adductor longus fibrocartilaginous entheses avulsion and related injuries in the pyramidalis anterior pubic ligament adductor longus complex (PLAC). Out of 145 patients there were 132 with full avulsions. The adductor longus was frequently found continuous or partially parted with the pyramidalis. Many patterns of PLAC injuries were observed, and the associated partial pectineus tears were frequent. The research has already highlighted the significance of evaluating all

the anatomical elements after the injury by use of MRI, and the name was given PLAC injury since more than two structures are usually involved.

In their study, Hassan et al. (2020) analyzed 94 football related news to gain insights into the type and the level of media coverage about football injuries in five popular Nigerian newspapers. The paper has pointed out the prevalence of football related injuries in Nigeria and how such media coverage may affect the mass consciousness and prevention strategies. The significance of systematic reporting of injuries to implement prevention programs is also highlighted in this study.

In their prospective study of acute adductor injuries in male athletes by MRI, Serner et al. (2018) discovered that the adductor longus was the most injured muscle, usually injured alone at three primary anatomical locations, and with proximal avulsion injuries being the most prevalent.

In a cohort study by Owoeye et al. (2017), the results of which were presented as a prospective study, in Nigerian football players, the power of the study was higher in males than in females, and players were mostly injured in the lower extremities, which is related to contact between the players. Injuries that were time-loss were predominantly insignificant in males but serious in females.

The reviewed empirical literature demonstrates that sports injuries and especially football injuries have continued to be a major health concern at all levels of participation and participation at the schools, and at the highest level of professionalism. The most common pattern in the literature is high proportion of musculoskeletal injuries, whereby lower limbs particularly the thigh, knee and ankle are the most affected body parts. These injuries are commonly linked to tackles,

overuse, poor pitch conditions, and inadequate protective gear, as mentioned in Nigerian based studies like those by Ogbonnaya *et al*. (2021) and Owoeye *et al.* (2017).There is a clear need to bridge this gap through local studies that will help assess sport injury prevalence and radiological diagnostic examination practices among Benin metropolis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research setting

The research was conducted at the Samuel Ogbemudia stadium benin city, Nigeria. The stadium was named after a former governor who had great interest in sports. It is majorly used for football activities; practice and national matches. It was opened in 1985 with a seating capacity of up to 19,500.It serves as home to Bendel Insurance FC and Edo queens FC (Samuel Ogbemudia Stadium, 2025). Data was collected from male footballers who are members of football clubs who train and play matches at this stadium.

3.2 Study design

The study was cross-sectional and prospective in design.

3.3 Target population

The target population for this study included 5 teams; True worshipers FC, Dynamo FC and Bendel insurance FC, Ugbowo Bumpers Fc and West gate Fc with at least 30 footballers registered with the clubs in Benin Metropolis, Edo State, Nigeria.

3.3.1 Inclusion criteria

i. Male footballers who were in Benin Metropolis
ii. Male footballers who were registered to a football club.
iii. Male footballers who have trained and played at least one full season within the last 1-2 years.
iv. Male footballers who have sustained a sports related injury during training or competition.

3.3.1 Exclusion criteria

i. Female footballers

ii. Non registered male football players

iii. Male footballers who have not sustained any sport related injury within the study period.

iv. Male footballers who were unwilling to provide informed consent.

3.4 Sampling technique and Sample size

A purposive sampling technique was used to select professional football clubs in Benin Metropolis that met predetermined inclusion criteria. Clubs were chosen because they had a stable roster of registered players, trained regularly at the Samuel Ogbemudia Stadium, and had a documented history of participating in competitive matches.

All eligible players within these clubs who met the inclusion criteria were invited to participate.

Purposive sampling was chosen because the study specifically targeted footballers with documented exposure to training and competitive activities individuals most likely to sustain sports injuries and utilize radiological services. Random sampling was not appropriate because many amateur or irregular players would not provide valid data regarding injury patterns or imaging use.

Sample size: The sample size for this study was 105 male footballers. Questionnaires were given to players who volunteered to participate in this study.

3.5 Instrument for data collection

Data was collected using a structured questionnaire. The questionnaire included both closed ended questions and open ended questions. The questionnaire was pretested for clarity and validity before administration to ensure it effectively captured the intended data. It had 3 different sections with a total of 21 questions.

- Section A: Demographic information.
- Section B:Injury history among players
- Section C: Radiological examination and medical management

The questionnaire is attached as appendix I

3.6 Validity of the instrument

To ensure content validity, the questionnaire was reviewed by the project supervisor. The questionnaire was validated by experts in Radiography and Football (Edo Football Association Chairman). Their feedback helped refine questions that were not well composed and ensure the questions were appropriate for the study objectives.

A pre-test of the questionnaire was conducted among 10 footballers from a club not included in the final sample. The pre-test assessed clarity, relevance, completion time, and logical flow. Based on the feedback such as difficulty interpreting certain injury types minor modifications were made before full administration. This process strengthened the face and content validity of the instrument.

3.7 Reliability of the instrument

The reliability of the instrument was assessed using Cronbach's alpha, yielding a reliability coefficient of 0.78, indicating good internal consistency.

3.8 Method of data collection

Participants were given a questionnaire with closed ended questions to complete as part of the data collection process Data was collected between June and August 2025 by the researcher. Printed questionnaires were distributed to the footballers.

3.9 Method of data analysis

Data were analyzed using SPSS version 29.0 Descriptive statistics (Frequencies and percentages) summarized the data, while inferential statistics was used to test relationships between variables. The Chi square test and Fisher's exact test was used to test associations. A p-value < 0.05 will be considered statistically significant.

3.10 Ethical consideration

Ethical approval was obtained from the Edo State Sports Commission . Informed consent was obtained from all participants before data collection. Participation was voluntary, and anonymity and confidentiality was assured. No personal identifiers was collected, and data was used strictly for research purposes. The ethical approval request and approval letter are attached as appendix III and IV.

CHAPTER FOUR

RESULTS AND DISCUSSION

The results from this study are presented in this chapter.These result include data obtained from descriptive (percentages and frequencies) and inferential statistics (Chi square test). The results are presented in narrative and tabular formats.

4.1 PRESENTATION

A total of 105 players from clubs within Benin Metropolis participated in the study. The mean age was 25.4 ± 5.0 years. The majority 39 (37.1%) were within the age group 26-30 years followed by 20-25 years which were 28 (26.7%), about 22 (21.0%) were below 20 years, and only 16 (15.2%). 30 years and above (Figure 4.1). Midfielders 42 (40.0%) constituted the largest group, followed by defenders 33 (31.4%), forwards 23 (21.9%), and goalkeepers 7 (6.7%).

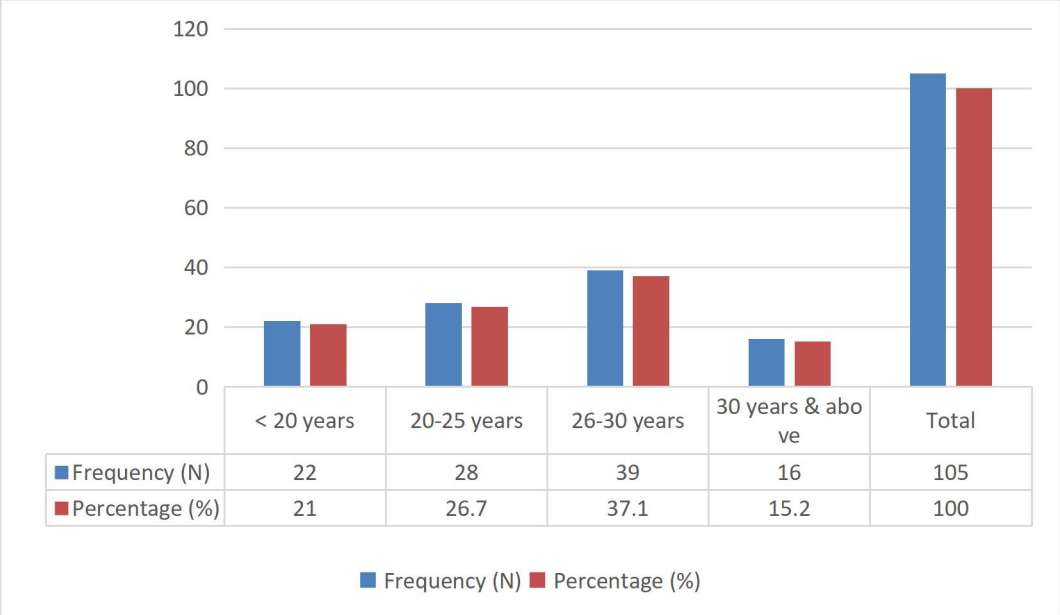

Figure 4.1: Age distribution of players

From Table 4.1, Bendel Insurance FC had the highest number of players 25 (23.8%), while Dynamo Sports, True Worshippers FC, Ugbowo Bumpers and West gate FC were 20 (19.0%) each.

Table 4.1: Club affiliation of players

Club Name	Frequency (N= 105)	Percentage (100%)
Dynamo Sports	20	19.0
True Worshippers Fc	20	19.0
Ugbowo Bumpers Fc	20	19.0
West Gate Fc	20	19.0
Bendel Insurance Fc	25	23.8

Most players had 7-8 years of professional experience 18 (38.1%), followed by 3-4 years 25 (23.8%), 4-5 years 19 (18.1%), 1-2 years 15 (14.3%), and more than 10 years 6 (5.7%) (Table 4.2).

Table 4.2: Years of professional experience of players

Years of play	Frequency (N)	Percentage (%)
1-2 years	15	14.3
3-4 years	25	23.8
4-5 years	19	18.1
7-8 years	40	38.1
>10 years	6	5.7

From table 4.3 below, the most commonly sustained injury was muscle strain 54 (51.4%), followed by sprain 28 (26.7%), dislocations 12 (11.4%), and fractures 11 (10.5%).

Table 4.3: Type of sport injury

Injury type	Frequency	Percentage
Muscle strain	54	51.4
Sprain	28	26.7
Fracture	11	10.5
Dislocation	12	11.4

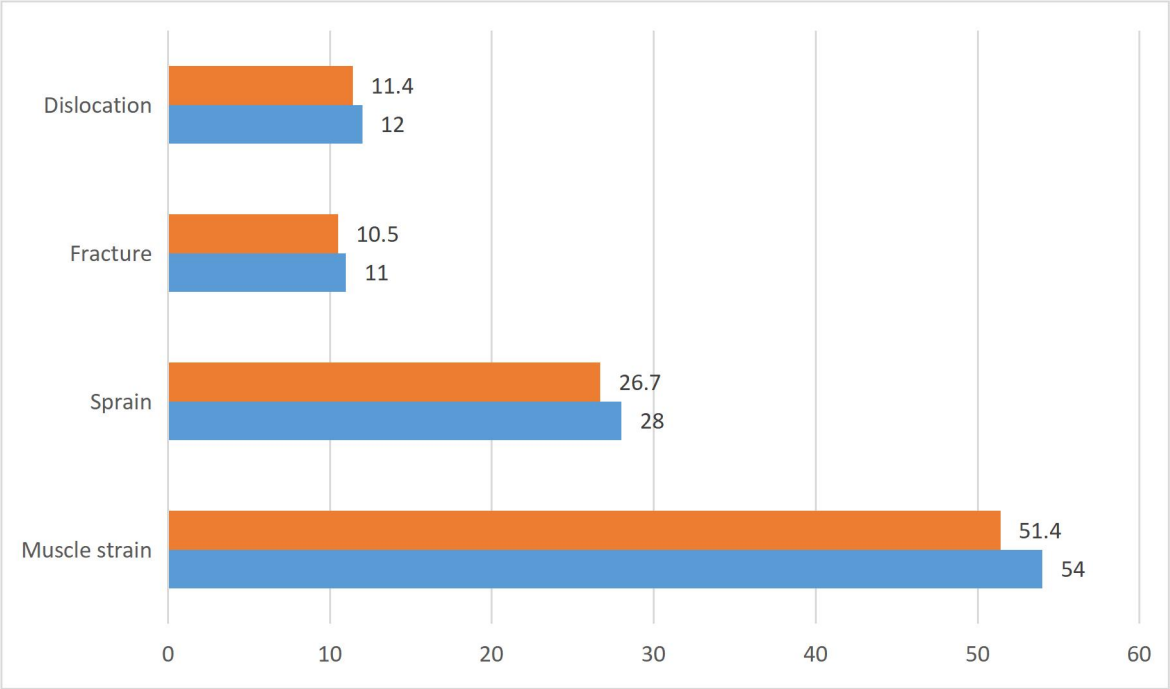

Figure 4 2: Type of injuries sustained by the players

Out of the 105 players, 97 (92.4%) reported sustaining a sport related injury during their football career, while only 8 (7.6%) had never been injured (Table 4.4).

Table 4.4: Prevalence of sport injuries

Response	Frequency	Percentage (%)
Yes	97	92.4
No	8	7.6

About 40% of the players sustained 6-8 injuries, 22.2% experiencing more than 9 injuries, 22.2% sustaining 3-5 injuries, and 15.6% reporting 1-2 injuries. (Table 4.5).

Table 4.5: Frequency of injury episodes

Number of times injured	Frequency	Percentage (%)
1-2 times	15	14.3
3-5 times	22	21.0
6-8 times	42	40.0
> 9 times	23	21.9

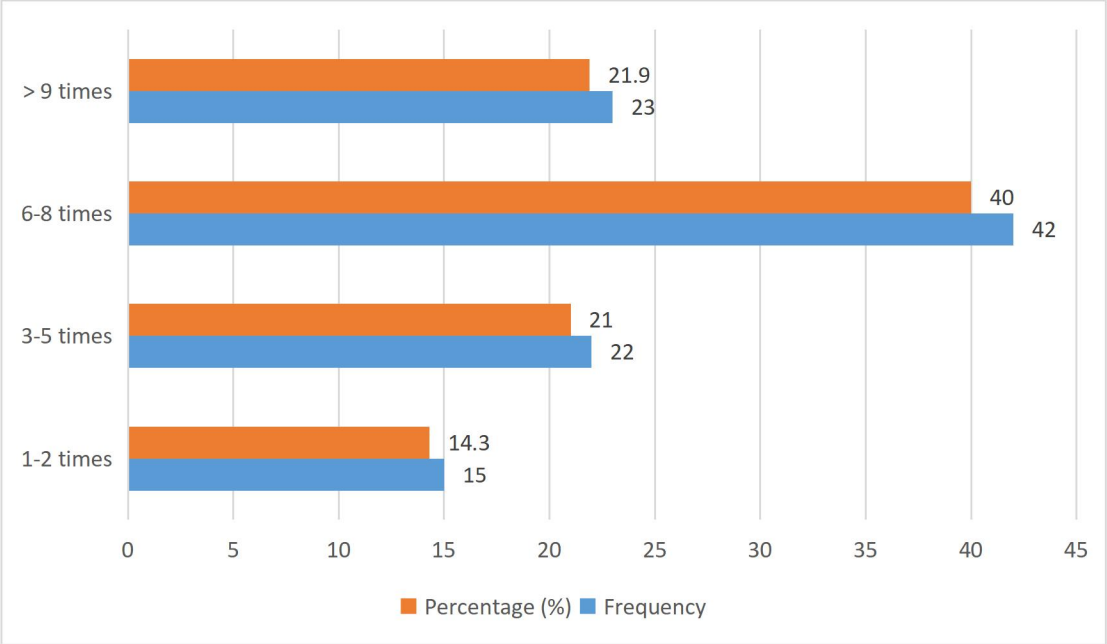

Figure 4 3: Frequency of injury episodes among players

The most frequently affected anatomical regions were the ankle 46 (43.8%) and knee 37 (35.2%), followed by the shoulder 7 (6.7%), hip/groin 7 (6.7%), feet/toe 6 (5.7%), and elbow 2 (1.9%) (Table 4.6).

Table 4.6: Anatomical regions affected

Region	Frequency	Percentage (%)
Knee	37	35.2
Ankle	46	43.8
Shoulder	7	6.7
Hip/Groin	7	6.7
Elbow	2	1.9
Feet/Toe	6	5.7

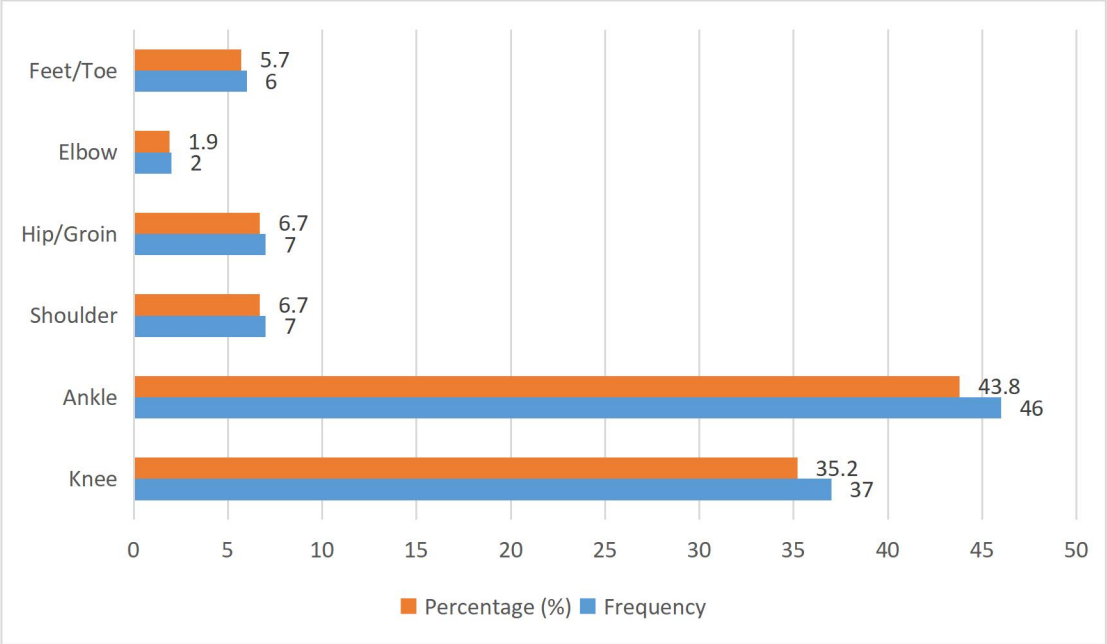

Figure 4 4: Most commonly affected anatomical region

From Table 4.7 below, out of the injured players, 37 (82.2%) underwent diagnostic imaging, while 8 (17.8%) did not.

Table 4.7: Diagnostic imagining procedure

Response	Frequency	Percentage (%)
Yes	86	81.9
No	19	18.1

From Table 4.8 below, the most frequently used modalities were X-ray 41 (39.0%) and CT scan 36 (34.3%), followed by ultrasound (6.7%) and MRI (2.2%). About 8 players (17.8%) did not undergo an imaging examination.

Table 4.8: Imaging modalities used

Modality	Frequency	Percentage (%)
No imaging	19	18.1
X-ray	41	39.0
MRI	3	2.9
CT scan	36	34.3
Ultrasound	6	5.7

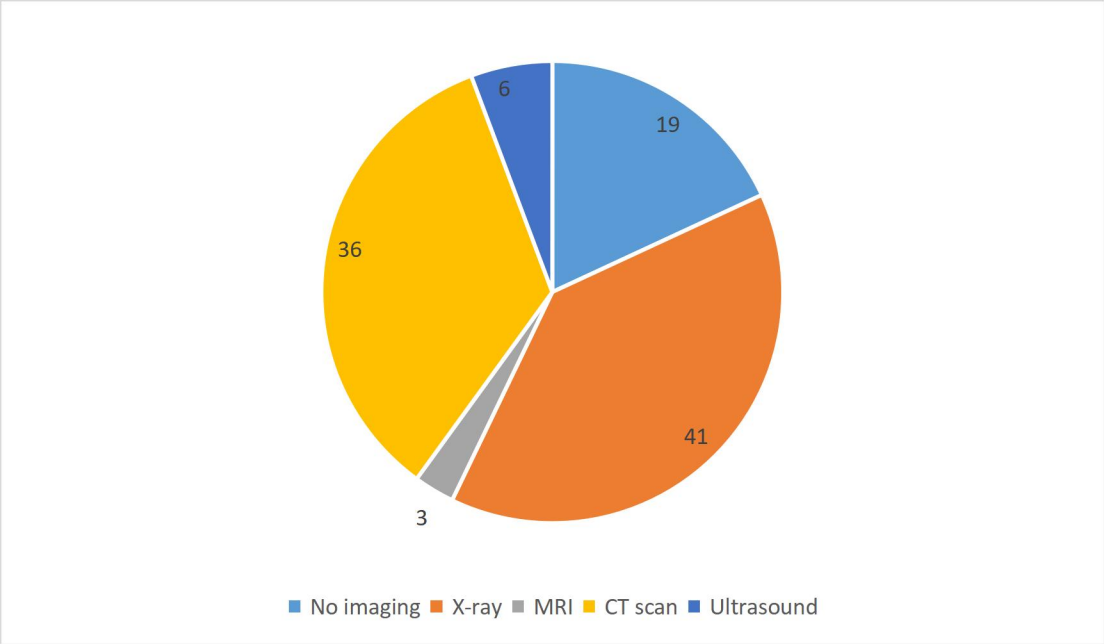

Figure 4 5: Imaging modalities used by players

Table 4.9 below shows that there was a statistically significant difference between age groups and frequency of injury (p = 0.011). Older players in the 26-30 age group and above experienced injuries more than the younger players (<20 years).

Table 4.9: Association between age and frequency of Injuries

Age	**If yes, how many times have you been injured?**				
	1-2 times	3-5 times	6-8 times	> 9 times	
<20yrs	2 (1.9%)	5 (4.8%)	10 (9.5%)	2 (1.9%)	
20-25yrs	8 (7.6%)	4 (3.8%)	9 (8.6%)	7 (6.7%)	(p = 0.011)
26-30yrs	3 (2.9%)	11 (10.5%)	18 (17.1%)	7 (6.7%)	
30yrs & above	2 (1.9%)	2 (1.9%)	5 (4.8%)	7 (6.7%)	

There was a significant association between training frequency and body region affected (p = 0.000). Among players who trained 2-4 times per week, injuries to the knee and feet/toe was common while those who trained 5-7 times per week had injuries to the ankle 46 (53.5%) and 26 (30.2%) had injuries to the knee (Table 4.10).

Table 4.10: Association between training frequency and body region affected

Which part of your body was	**Frequency of training per week**		**P value**
mostly affected?	2-4 times	5-7 times	
Knee	11 (57.9%)	26 (30.2%	
Ankle	0 (0.0%)	46 (53.5%)	
Shoulder	0 (0.0%)	7 (8.1%)	0.000
Hip/groin	0 (0.0%)	7 (8.1%)	
Elbow	2 (10.5%)	0 (0.0%)	
Feet/toe	6 (31.6%)	0 (0.0%)	

Satisfaction with radiological and medical management was high, with 83 (79%) expressing satisfaction, 3 (2.9%) dissatisfaction, and 19 (18.1%) gave no response.

Table 4.11: Satisfaction with radiological and medical management

Response	Frequency	Percentage (%)
None	19	18.1
Yes (Satisfied)	83	79.0
No (Not satisfied)	3	2.9

There was no statistically significant association between between the type of sports injury sustained and the use of radiological diagnostic imaging ($p = 0.052$) (Table 4.12). Although imaging use was higher among respondents with muscle strain and fracture

Table 4.12: Association between the type of sports injury sustained and the use of radiological diagnostic imaging

Type of Injury	Imaging used (Yes)	Imaging used (No)	p-value
Muscle strain	48 (88.9)	6 (11.1%)	
Sprain	6 (54.5%)	5 (45.5%)	0.052
Fracture	23 (82.1%)	5(17.9%)	
Dislocation	9 (75.0%)	3 (25.0%)	

Out of the 105 players, a total of 86 (81.9%) had done diagnostic imaging after their injuries, while 19 (18.1%) did not. Among those who had imaging, the most frequently used modality was Xray 41 (39.0%) followed by CT 36 (34.3%). Ultrasound was used by 6 (5.7%) players, while MRI was used by only 3 players (2.9%). Only 19 (18.1%) players gave no response regarding imaging modality.

About 50 (47.6%) players had their scans done in government hospitals, 19 (18.1%) in club medical facilities, and 18 (17.1%) in private diagnostic centers. Another 19 (17.1%) did not provide any response. This demonstrates that most players rely heavily on government hospitals rather than club based or private facilities for diagnostic imaging services.

The timing of imaging after injury varied among respondents. 15 respondents (14.3%) underwent imaging immediately after injury, 5 (4.8%) players were imaged within 1-3 days, and 66 (62.9%) players had their imaging more than three days after injury. 18 (18.1%) players did not specify the timing

When asked whether imaging assisted in making diagnosis, 77 (73.3%) agreed that imaging helped to confirm their diagnosis, while 10 (9.5%) disagreed, and 18 (17.1%) gave no response.

Concerning referral, 78 (74.3%) stated that they were referred to a radiographer or radiologist, while 8 (7.6%) players said they were not referred, and 19 (18.1%) gave no response.

Only 16 (15.2%) reported physical deformity, 63 (60.0%) said the injury caused psychological stress to them, and 26 (24.8%) reported financial burden due to their injuries.

More than half 58 55.2%) players were advised to undergo additional imaging, while 42 (40.0%) players were not advised, and 5 (4.8%) did not provide a response. Finally, when asked whether imaging helped to speed up recovery, 77 players(73.3%) agreed, 4 (3.8%) players disagreed, 6 (5.7%) were unsure, and 18 (17.1%) gave no response.

Summary of Key Findings

One hundred and five registered footballers of different clubs in Benin Metropolis were sampled in the study with a mean age of 25.4 +- 5.0 years. The majority of the players had the age 26-30 years (37.1%), and the majority of the playing group was represented by midfielders (40%). Bendel Insurance FC was the most represented (23.8%). Most players had 7-8 years of active play (38.1) in terms of professional experience.

Injuries: Prevalence and Types:

In the study, prevalence of sports injuries was very high as 97 players (92.4%) indicated that they had at least one sports injury in their career. The most prevalent injury was muscle strain (51.4%), next were sprains (26.7%), dislocations (11.4%), and fractures (10.5%). The rate of injury recurrence was found to be high with 6-8 times of injury in nearly 40 percent of players and over nine incidences in 21.9 percent of them.

Affected Areas: Anatmically.

The most common injured anatomical parts were the ankle (43.8%), and the knee (35.2%), which are in line with the football demands. Other less affected areas were the shoulder, hip/groin, feet/toe and elbow.

Use of Radiological Imaging:

The diagnostic imaging was common and 81.9% of the injured players had some sort of radiological examination. The modalities used most frequently were X-ray (39.0) and CT scan (34.3), whereas ultrasound (5.7) and MRI (2.9) were used significantly less. Almost half of the players (47.6%) used imaging in government hospitals, and less used club facilities (18.1) or in private diagnostic centers (17.1).

Time and Diagnostic Usefulness of Imaging:

The majority of the imaging procedures (62.9) were performed over three days following injury, with 14.3% of imaging being performed immediately. Most players (73.3) confirmed their diagnosis using imaging and 74.3% were actually referred to a radiographer or radiologist. More than half (55.2) were recommended to have further imaging.

Outcomes and Problems in patients:

Only a minor percentage (15.2) of them had reported physical deformities as a consequence of their injuries and far bigger percentage (60.0) had reported being under psychological stress and 24.8 percent had reported financial burden on their shoulder. In terms of clinical outcomes, 73.3% considered imaging to be useful in making the recovery quicker.

Significant Associations:

There was a strong correlation between age and number of injuries ($p = 0.011$) as players of older age were injured more. The frequency of training was also found to be significantly correlated with the affected part of the anatomy ($p = 0.000$).

Nevertheless, there was no extensive correlation between image of injury and imaging ($p = 0.052$).

4.2 DISCUSSION

In the current study, the prevalence of injuries was documented as 92.4, which is quite large compared with the values taken in numerous previous studies in the various parts of the world. Even though studies by Owoeye et al. (2017) and Ogbonnaya et al. (2021) carried out in Nigeria reported equally high prevalence rates of 87 and 86 respectively, the current results are even higher. The rates of injuries are lower internationally. The prevalence was reported as 65% in professional European footballers (Ekstrand et al., 2011), whilst the prevalence estimates in South America were around 70-75% in elite clubs in Brazil (Lopez-Valenciano et al., 2020). Similar tendencies can be observed in Asian studies; e.g. Majumdar et al. (2020) found 66.8% prevalence in competitive Indian football players. The fact that the prevalence was significantly high in Benin Metropolis indicates contextual factors, especially on infrastructure, supervision, and medical support systems. In European and South American leagues, which are characterized by developed sports medicine programs, teams have maintained a strict injury prevention policy, are using biomechanical screening, and have a special medical team. The high rate of injury burden is probably due to the low access to such structured systems in Nigeria.

The most prevalent type of injury was muscle strain (51.4%), then sprains, dislocations and fractures. This trend tends to be close to the epidemiology of the world. In the English Premier League, Fuller et al. (2016) find muscle strains (in particular, hamstring strains) to be the predominant category of injury in football, as do other international reports (Hagglund et al., 2013, in Sweden, and Noya and Sillero, 2013, in Spain). The universality of the pattern indicates that it is an intrinsic

requirement of biomechanical demands of the sport, especially explosive sprinting and accelerated change of direction. The uniformity of the current research with that of high-resource facilities means that the basic nature of football-related soft tissue injuries does not surpass geographical and infrastructural boundaries. But improper conditioning schedules, insufficient preseason examination and poor warm-up habits - all more common in underdeveloped football cultures - can only increase the threat.

The anatomical distribution of injury in this study where ankle and knee are the most affected parts also reflects consistent patterns throughout the world. Similar findings are found regarding lower limb injuries, which constitute more than 70% of football-related injuries (studies by Australia (Orchard and Seward, 2010), Middle East (Al-Hadithi et al., 2020), and Europe (Ekstrand et al., 2013) report the same. These joints carry heavy loads during weight bearing, tackling, pivoting, and jumping and these are universal. Nevertheless, the prevalence of ankle and knee injuries within the present research is also likely to be related to the environmental issues, including the lack of even playing fields, a problem that has been reported in African contexts but is much less prevalent among the well-organised European or Asian clubs.

This more dramatic difference can be seen in the trend of radiology imaging. MRI is the imaging modality of sports-related soft tissue injuries in high-income countries because it is more sensitive. Evidence-based research on elite-level competitions, including MRI usage in the 2022 FIFA world cup (Bordalo et al., 2025) and medical reports in the UEFA champions leagues (Ekstrand et al., 2012) demonstrates rates in the MRI use of over 60-70 percent in musculoskeletal imaging. Conversely, this research established that X-ray (39.0%) and CT scan (34.3) were the leading

diagnostic evaluations with MRI (2.9) and ultrasound (5.7) being used infrequently. Other low- and middle-income countries have been reported to have similar patterns. Studies carried in India (Majumdar et al., 2020) and Kenya (Nduati et al., 2018) report that people resort to the use of simple imaging modalities because of the lack of MRI and its high price. The statistical data of South America have a marginally better distribution, yet even there, MRI is concentrated in elite clubs that have the financial resources. The low application of MRI in Benin Metropolis is hence typical of the greater LMIC trends and indicative of infrastructural and socioeconomic limitations.

The timing and perceived effects of imaging is another significant issue. Although few players were directly put under imaging, most of them still recognized the importance of imaging in making the diagnosis and aiding the restoration. The result aligns with the findings of other countries: research of Italy (Battaglia et al., 2014) and Japan (Otsubo et al., 2019) and Brazil (Pupim et al., 2021) also indicate that timely and appropriate imaging is a beneficial factor in clinical decision-making and prognosis in sports medicine. However, the fact that early advanced imaging is not present in the current setting is probably a contributing factor to the delays in the diagnosis of the ligamentous and muscular damage that could prolong the recovery process and predispose to the risk of re-injury.

Due to injury effects, this research did not just limit itself to the physical consequences. A majority of players were found to have experienced psychological distress (60 percent) which matched the findings of the study by Gouttebarge et al. (2015) who reported high prevalence of anxiety, depressive symptoms, and emotional

strain in injured professional footballers in Europe. Psychosocial issues of this type have also been cited in South America (De Almeida-Neto et al., 2020) and Asia (Li et al., 2022). The psychological toll thus seems to be common in football environment though the financial strain, having 24.8% of the respondents, is more evident in the low-resource environment where insurance cover, club-funded rehabilitation, and welfare infrastructure are minimal.

The substantial correlation of training frequency and site of injury are consistent with international research that relates high training loads with the strains of musculoskeletal loads. Research by Windt et al. (2017) in Australia and Bowen et al. (2020) in England indicates that the strength of training intensity and loading spikes are good predictors of lower-limb injury. Likewise, the correlation between age and injury frequency in the current study can be related to the results of both African and international datasets and confirms the role of cumulative exposure and age-related alterations of the physiological aspect of injuries in predisposition.

Interestingly, the lack of a large correlation between the type of injury and imaging utilization can be due to the practical consideration, and not necessarily clinical considerations. Both the American College of Radiology (ACR, 2021) and the European Society of musculoskeletal radiology guidelines include in their international best practice guidelines consider modality selection by the type of injury. But in a variety of low-resource environments, as Chen et al. (2024) also observe, imaging decisions are frequently cost-based, availability-based, and urgency-based, instead of being guided by adherence to guidelines. This appears to be in line with the current results.

In general, this extended discussion shows that some of the patterns of injuries in Benin Metropolis are consistent with the global trends in football, but there are other major differences, especially in access to imaging, injury prevention, and psychosocial support, which increase the burden of injuries. The results of this research highlight the significance of better sport medicine centers, outstanding diagnostics routes, and interdisciplinary teamwork that would bring the local football health systems on par with the global ones.

CHAPTER FIVE

5.1 CONCLUSION

Professional footballers in Benin Metropolis had high prevalence (92.4) of sports injuries. The frequent injuries were muscle strains, sprains. Radiological imaging was frequently used, particularly CT and X-ray, while MRI and ultrasound were not regularly used. There were significant associations between age and frequency of injury ($p = 0.011$) and between training frequency and body region affected ($p = 0.000$), while no significant relationship was found between injury type and imaging utilization ($p = 0.052$).

5.2 RECOMMENDATIONS

1. There should be incorporation of radiological evaluation of sports injury into radiography curricula to build capacity in the field.
2. Establishment of well equipped sports medicine units with radiological facilities to ensure prompt diagnosis and treatment.
3. Radiographers and radiologist should increase awareness of the value of MRI and ultrasound in soft tissue injury evaluation.
4. Radiographers and radiologist should collaborate more closely with sports physicians for integrated injury management.
5. Improve access to advanced imaging modalities for athletes through subsidized services or club and government partnerships.
6. Development of policies mandating injury surveillance systems in professional football clubs. Adhere strictly to physiotherapy and rehabilitation protocols to minimize recurrence.

7. Prioritization of mental health support to players, as psychological stress was the most common effect of injury.

5.3 LIMITATIONS

1. A small sample size was used for the study. This may have limited the statistical power to detect significant associations between some variables.
2. The research was conducted among footballers within Benin Metropolis only therefore limiting the generalizability of the findings to all footballers in Nigeria.
3. The study relied on players' reports rather than medical records, so the accuracy of reported injury types and imaging details could not be independently verified.

5.4 SUGGESTION FOR FURTHER STUDIES

1. Future studies should include larger sample sizes across multiple clubs and cities in Nigeria to improve generalizability of results.

2. Research can be conducted to evaluate the diagnostic accuracy and cost effectiveness of different radiological modalities in the management of sport injuries.

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APPENDIX I: Questionnaire

ASSESSMENT OF SPORT INJURY PREVALENCE AND RADIOLOGICAL DIAGNOSTIC EXAMINATION PRACTICES AMONG MALE FOOTBALLERS IN BENIN METROPOLIS

My name is Martins Praise Tochukwu with matriculation number BMS2005195, I am a final year undergraduate student from the Department of Radiography, School of Basic Medical Science, University of Benin. I am conducting a research study on the topic titled "Assessment of sport injury prevalence and radiological diagnostic examination practices among male footballers in benin metropolis" in partial fulfillment of the requirements for the award of a Bachelor of Science degree in Radiography.Under the supervision of my lecturer Akpobasahan E. A.(Dr.)

Kindly help complete this questionnaire

Please select the appropriate option.

Section A: Demographic information

1. Age: _____
2. Club name: _____
3. Number of years as a professional footballer: _____
4. Position played: ☐ Goalkeeper ☐ Defender ☐ Midfielder ☐ Forward
5. Frequency of training per week: _____

Section B: Injury history

6. Have you ever sustained a sport related injury during your football career? ☐ Yes ☐ No
7. If yes, how many times have you been injured? _____
8. What types of injuries have you sustained? (Check all that apply):
   ☐ Muscle strain ☐ Sprain ☐ Fracture ☐ Dislocation ☐ Concussion ☐ Others: _____
9. How long were you out of play due to this injury? ☐ <1 week ☐ 1–2 weeks ☐ >2 weeks
10. Was the injury recurrent? ☐ Yes ☐ No
11. Which part of your body was mostly affected?
    ☐ Knee
    ☐ Ankle,

☐ Shoulder
☐ Hip/groin
☐ Elbow
☐ Head or face
☐ Feet/toe
Others: _____

Section C: Radiological examination and medical management

12. Did you undergo any diagnostic imaging for your injury? ☐ Yes ☐ No
13. If yes, which imaging modalities were used?
    ☐ X-ray ☐ MRI ☐ CT scan ☐ Ultrasound ☐ Others: _____
14. Where was the imaging done?
    ☐ Club medical facility ☐ Government hospital ☐ Private diagnostic center
15. How long after the injury was imaging performed?
    ☐ Immediately ☐ Within 1-3 days ☐ More than 3 days
16. Did the imaging assist in making a clear diagnosis? ☐ Yes ☐ No
17. Were you referred to a radiologist or radiographer? ☐ Yes ☐ No
18. Were you satisfied with the radiological and medical management received? ☐ Yes ☐ No
19. Did the injury have any of the following effects? ☐ Physical deformity ☐ Psychological Stress ☐ Financial burden
20. Were you advised to undergo follow up imaging? ☐ Yes ☐ No
21. Do you think imaging helped speed up your recovery process? ☐ Yes ☐ No ☐ Not Sure

APPENDIX II: Ethical approval request

Department of Medical Radiography,
School of Basic Medical Sciences,
University of Benin,
Edo State.
June 2025.

The Executive Chairman,
Edo State Sports Commission
Samuel Ogbemudia Sports complex
Stadium road,
Benin City, Edo State.

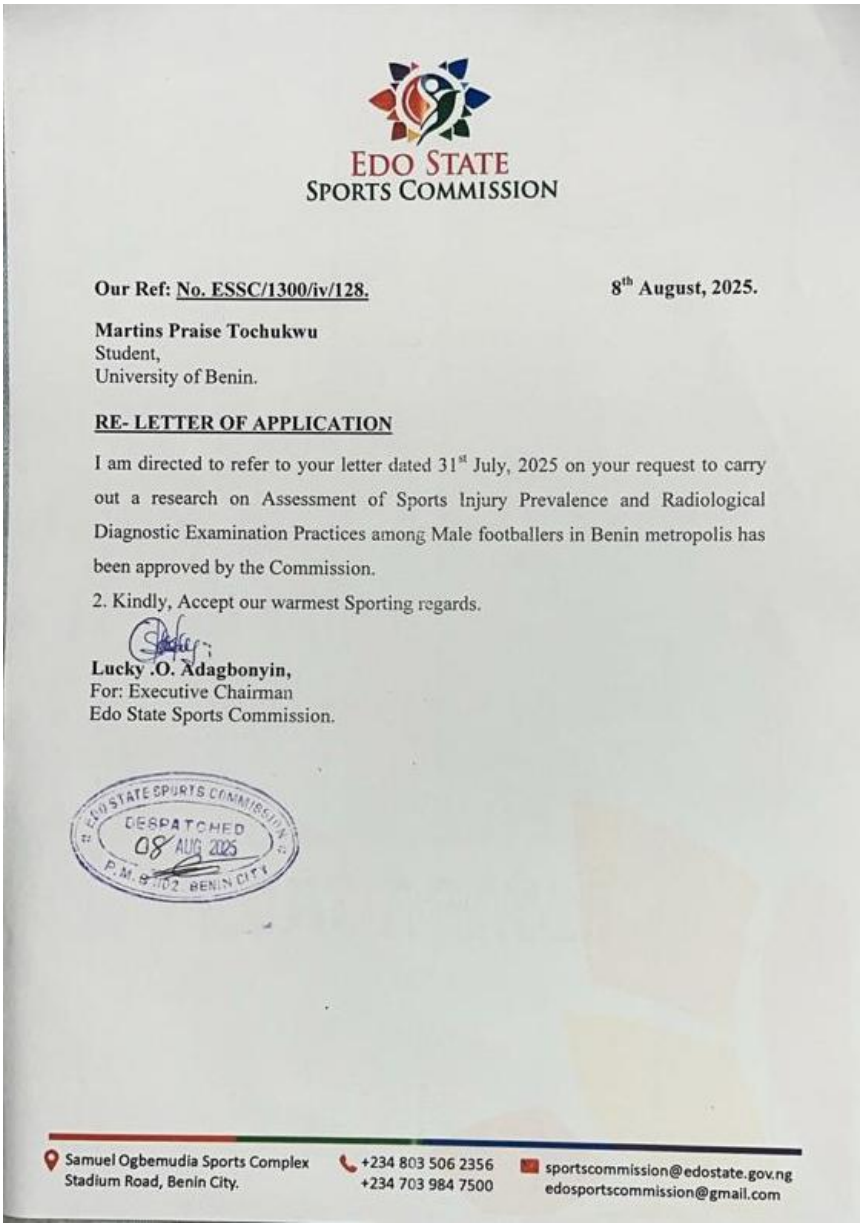
Dear Sir/ma,

APPLICATION FOR ETHICAL APPROVAL TO CONDUCT A RESEARCH STUDY

I Martins Praise Tochukwu with registration number BMS2005195, hereby apply for the above subject. I am a final year undergraduate student from the Department of Radiography, School of Basic Medical Science, University of Benin. I kindly request for ethics approval to conduct a research project on the topic titled "Assessment of sport injury prevalence and radiological diagnostic examination practices among male footballers in benin metropolis" in partial fulfillment of the requirements for the award of a Bachelor of Science degree in Radiography. Attached is a copy of my research project proposal. I hope my request will be considered.
Yours Faithfully,

Martins Praise Tochukwu
07067235386

APPENDIX III: Ethical approval letter



EDO STATE
SPORTS COMMISSION

Our Ref: No. ESSC/1300/iv/128. **8th August, 2025.**

Martins Praise Tochukwu
Student,
University of Benin.

RE- LETTER OF APPLICATION

I am directed to refer to your letter dated 31st July, 2025 on your request to carry out a research on Assessment of Sports Injury Prevalence and Radiological Diagnostic Examination Practices among Male footballers in Benin metropolis has been approved by the Commission.

2. Kindly, Accept our warmest Sporting regards.

Lucky .O. Adagbonyin,
For: Executive Chairman
Edo State Sports Commission.

EDO STATE SPORTS COMMISSION
DESPATCHED
08 AUG 2025
P.M.B. 1402 BENIN CITY

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