

**FACTORS ASSOCIATED WITH SPORTS INJURIES AMONG FIRST
DIVISION FEMALE SOCCER PLAYERS IN RWANDA.**

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**A full thesis submitted in partial fulfilments of the requirements of the degree
of Masters of Science in the Department of Physiotherapy,**

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Key words

Soccer

Recurrent injury

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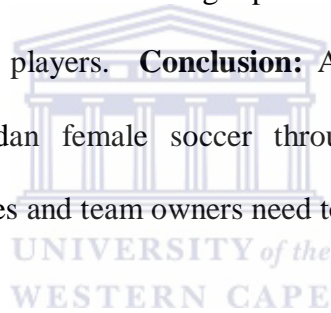
Rwanda.



ABSTRACT

Background: Few studies have documented soccer injuries among Rwandan male soccer players. However, no study has been conducted among female soccer players in Rwanda. **Aim:** The aim of this study was to establish the factors associated with sports injuries among first division Rwandan female soccer players. **Methods:** A cross-sectional study design using both qualitative and quantitative methods was used to investigate the factors associated with sports injuries in female soccer players. All 12 teams in the first division were approached. A self-administered questionnaire using closed-ended questions and a face to face structured interview was used to collect data regarding injuries sustained and coaches' perspectives on return to sport following injuries. The quantitative data was analysed using the Statistical Package for Social Sciences (SPSS) version 18.0. The chi square test (χ^2) was used to test for association between injuries and hypothesized factors at 5% level of significance ($\alpha = 0.05$). The qualitative data analysis had been done by reading through the transcripts several times, making as many headings necessary to describe all aspects of the content. Ethical clearance was granted by the University of the Western Cape and the relevant authorities in Rwanda. The participation was voluntary and anonymity and confidentiality was ensured. Participants were free to withdraw from the study without explanation at any time if they wished to. **Results:** 300 female soccer players and 12 head coaches participated in the study. Almost half (45%) of the participants sustained injuries in the last three competitive sessions. Of these, 46.7% occurred during training and 53.3% during competition. No team had qualified medical practitioner to look after injured players. Protective equipments

for injury prevention were only used during competition by majority of the players. Recurrent injury rate was high and intrinsic risk factors like age, height, weight, joint laxity, OCP use, premenstrual symptoms, previous injuries and poor rehabilitation together with extrinsic risk factors including player's position, preventive techniques, use of protective equipment, national team and competition level were found to be strongly associated with injury occurrence. Social support and assistance perceived by injured players and coaches perspectives and roles in returning injured players were poorly directed and less effective. The lack of a well planned gradual program for returning injured players and the final decisions to be taken by coaches alone resulted in high prevalence of injury recurrence in Rwandan female soccer players. **Conclusion:** Advocacy about the safety and improvement of Rwandan female soccer through workshops and trainings involving players, coaches and team owners need to be emphasised.



Declaration

I hereby declare that “ Factors associated with sports injuries among first division female soccer players in Rwanda” is my own work, that it has not been submitted, or part of it, for any degree or examination in any other university, and that all resources I have used or quoted have been indicated and acknowledged by complete references.

J.D. Niyonsenga

Signature.....

May 2011



Witness:

.....

Prof. J. Phillips.

Dedication

I dedicate this thesis to my parents for their continuous parenting care, prayers and support. This achievement is the reaping of the seeds you have sown. May God abundantly continue to bless you.

I dedicate this work also to all whom it will be helpful.



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C: Consent form signed by participants to witness a voluntary participation in English

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E: Consent form signed by participants to witness a voluntary participation in Kinyarwanda

F: Information sheet explaining the purpose of the study in English

G: Information sheet explaining the purpose of the study in English

H: Information sheet explaining the purpose of the study in English

I: Ethical clearance letter from UWC

J: Acceptance letter from FERWAFWA

K: Acceptance letter from MINESPOC

L: Questionnaire in English

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CHAPTER ONE: INTRODUCTION

1.1 Introduction

This chapter presents the background of the study. This study investigated the factors associated with injuries among Rwandan female soccer players. The statement of the problem, research questions, aim of the study, objectives, significance as well as the definition of the terms used in this study are highlighted and presented in this chapter.

1.2 Background of the study

Football, also called soccer to distinguish it from the American football, is the most popular team sport around the world. It is practised in more than 208 countries (FIFA, 2008a) and performed by men, women, children and adults at different levels of expertise (Bangsabo, 1994). It is played by kicking, heading or using any body part except the arms and hands which are only allowed to be used by the goalkeeper. The game accounts for two separate halves of 45 minutes each with 15 minutes of rest in between (Putukian, 2000). At the time when football started it was categorically for men but as it gained popularity females also increasingly joined and more than 40 million females are currently registered by the International Federation of Football Association (FIFA) as soccer players in the world (Tegnander, Moholdt, Engebretsen & Bahr, 2008). The popularity of female soccer is continuously increasing worldwide and its ranking range from first (USA) to fifth (North Korea) in various parts of the world (FIFA, 2010). Female soccer, as is the case with male soccer, is practised more in developed rather than in developing countries.

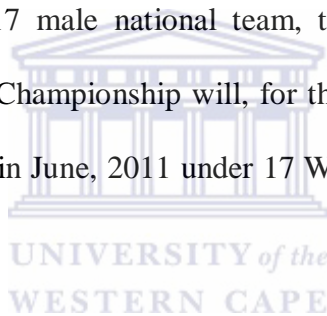
Several studies highlighted the increased rate of soccer injuries proportionally to its increased popularity, but very few of them were specific for female soccer players (Bell, Mangione & Hemenway, 2000). It is not surprising that, as results of its high intensity and the amount of collisions among players as well as the playing surface that the amount of injuries sustained will be high. It has been estimated that on average, every elite male soccer player sustains approximately one performance limiting injury each year (Junge & Dvorak, 2004). According to researchers, injury rates for females also appear to be higher in games than in training sessions as is the case with males (Tegnander, Olsen, Moholdt, Engebretsen & Bahr, 2008). Several studies have highlighted both the difference and similarities of injuries among male and female soccer players. Extrinsic factors associated with injuries such as level of competition, skill level, shoe type, use of taping and brace and playing surfaces have been identified for both male and female soccer players. Research has however highlighted the different intrinsic factors associated with injuries among female soccer players such as age, body size, limb girth, postural stability, anatomical alignment, foot morphology, hormonal and menstrual cycle influences (Sports injury clinic, 2010; Bennett & Fawcett, 2006; Biedert & Bachmann, 2005; Giza, Mithofer, Farrell & Gill, 2005; Murphy, Connolly & Beynnon, 2003; Silberberg, 2010). There is a tremendous increase of soccer injury rate, variety of types of injury and severity. Therefore, measures in sports injury management have to be reinforced. Studies have revealed that if proper warm up and conditioning together with correct use of protective equipment and good training regimen were respected, more than 75% of all soccer injuries would be prevented (Sports injury clinic, 2010).

Female soccer is in its early stage in many African countries with the African Confederation of Football (CAF) controlling each country's Football Federation and connecting them to FIFA which coordinates football around the world (FIFA, 1997). In most African countries, female and male soccer is under one national football association which could possibly lead to delayed development of female soccer. Very few studies had been done about female soccer in Africa but in Nigeria which is the first ranked in Africa, female soccer has become more popular and grown more visible over the past decade (FIFA, 2009). According to the South African Football Association (SAFA) (2004), South African female soccer championships are organised in different provinces and more than 300 clubs are registered.

Female soccer was recently started in Rwanda which might be the reason for not finding enough information related to female soccer in this country. However, the increase in the number of people participating in soccer is high in Rwanda (FIFA, 2008b). Currently, only one division female championship with 12 registered female soccer teams is organized. Each team registered 30 players and the total of 360 female soccer players are registered by the Rwandan Federation of Football Amateur (FERWAF). Even though the number of female soccer participants is extremely low compared to the developed countries, the rate of injuries related to soccer is high which might be due to intrinsic and extrinsic factors predisposing female soccer players to injuries (Lahmander, Ostenberg, Englund & Roos, 2004). Furthermore, poor rehabilitation and lack of follow up processes responsible for injury recurrence could be associated with high injury rates (Hakizimana, 2002). In addition, negligence to implement preventive

measures for injuries, low knowledge level of team trainers and inadequate training sessions are also noticed (Hakizimana, 2002).

The level of Rwanda football is continuously improved and well rated in the region and internationally. This is explained by Rwandan clubs and national teams of different international age groups' participation and their performance in different regional and continental competitions. As result, these have motivated and boosted the participation rate, especially among youth, and have attracted different investors to invest in soccer resulting in the creation of football school academies countrywide. Currently, 8 schools of football academies have been created and the under 17 male national team, the dauphin of 2010 under 17 African Cup of Nations Championship will, for the first time ever, be one of the four representing Africa in June, 2011 under 17 World Cup which will take place in Mexico.



The success therefore of this tremendous improvement over the Rwandan male soccer counterpart relies on the conjugated efforts of individuals, privates investors, federation and government through the Ministry of Sports and Culture (MINESPOC). The same efforts should be doubled or even tripled to raise the Rwandan female soccer level up to the regional and continental competitive level as its male counterparts.

It remains a big challenge that Rwandan female soccer has no sponsor yet apart from the Rwandan federation (FERWAFa). As result, no senior female team in Rwanda has a junior team due to lack of stable sponsorship to raise two teams simultaneously. This affects the level of competition in the league and favours the

richest teams, especially those in central city Kigali, who easily win the league. Thus far, no football school academy is accepting motivated, talented and passionate young Rwandan female soccer players which is strongly handicapping the development of Rwandan female soccer.

Currently, no study has been conducted in Rwanda to investigate the magnitude of injuries among female soccer players in first division for females.

1.3 Problem statement

The rate of injuries is continuously increasing with the increase in participation among female soccer players. Very few studies have been conducted to clarify the factors associated with injuries in female's soccer players. Rwanda is also characterized by an increased number of female soccer players at all levels: schools, districts, provinces and national levels. However, no study has been conducted to investigate soccer injuries among female players and the factors associated with them.

1.4 Research questions

1. What are the factors associated with injuries among female soccer players in Rwanda?

1.5 The aim of the study

The overall aim of the study is to establish the factors associated with sports injuries in first division Rwandan female soccer players.

1.6 Objectives of the study

1. To establish the prevalence of sports injuries among female soccer players in the first division in Rwanda.
2. To establish the mechanism, location and re-occurrence of injuries among Rwandan female soccer players in the first division.
3. To establish the association of selected intrinsic and extrinsic factors with sports injuries among female soccer players in the Rwandan first division.
4. To establish injured players' perception of social support provided by their coaches.
5. To explore coaches' perspectives on the return to sport of injured players, their role in the decision making to return players to training and competition and their role in assisting returning soccer players from injury.

1.7 Significance of the study

The results of this study will help the female soccer players, team trainers, team coaches and team managers cope with the preventive protocols and consider numerous predisposing factors to minimize injury rate. Furthermore, the results could assist medical team practitioners to highlight and develop a multidisciplinary team approaches for the management and rehabilitation of soccer injuries. Finally, the results could be used to start a data base for the National Olympic Committee and Rwandan Federation of Football to promote safety in female soccer.

1.8 Definition of the key terms used in the study

Injury: An incident occurring during a training session or match causing a soccer player to miss the following sessions (Orchard, 2001).

Recurrent injury: An injury of the same type and the same site which occurs after a player's return to full participation from the previous similar injury (Fuller et al., 2006).

Soccer: Also known as football, is a game played on a rectangular field with net goals at either end in which two teams of 11 players try to drive a ball into the other's goal by kicking, heading or using other body parts except arms and hands allowed for goalkeepers only within the penalty area in front of the goal. The game accounts for two separate halves of 45 minutes each with 15 minutes of rest between them (Putukian, 2000).

Intrinsic risk factor: Any agent within the athlete's body influencing injury occurrence (Orchard, 2001).

Extrinsic risk factor: Any agent outside the athlete's body influencing injury occurrence (Orchard, 2001).

Rehabilitation: Process intended to enable people with disability to reach and maintain optimal physical, sensory, intellectual, psychological and/or social function. Rehabilitation encompasses a wide range of activities including rehabilitative medical care, physical, psychological, speech, occupational therapy and support services (WHO, 2007).

1.9 Abbreviations used in the study

FIFA: Fédération Internationale de Football Association

CAF: Confédération Africaine de Football

SAFA: South African Football Association

FERWAF: Fédération Rwandaise de Football Amateur

F-MARC: FIFA- Medical Assessment and Research Centre

MINESPOC: Ministry of Sports and Culture

ROM: Range Of Motion

ACL: Anterior Cruciate Ligament

PNF: Proprioceptive Neuromuscular Facilitation

NWI: Notch Width Index

AIS: Active Isolated Stretching

OCP: Oral Contraceptive Pill

BMI: Body Mass Index

ICF: International Classification of Functioning Disability and Health

UNICEF: United Nations Children's Fund

WHO: World Health Organization

SD: Standard Deviation



SPSS: Statistical Package for Social Science

Vs: Versus

1.10 Summary of the chapters

Chapter one presents the basis of the present study. It gives a broad overview of the studies conducted on female soccer worldwide and describes female soccer in Rwanda. The motivation of the study, significance, aim and objectives of the study are also presented in this chapter.

In chapter two, the general overview of female and soccer were reviewed. The prevalence, type, severity and mechanism of injuries were described. The intrinsic and extrinsic risk factors associated with injury occurrence in female soccer players together with nutrition, prevention and rehabilitation, players' perceptions and coaches perspectives on social support, assistance and returning injured players to sport activities are highlighted.

In chapter three, the research setting is described as well as the structure of female soccer in Rwanda. It presents the study design of the study which is a descriptive cross-sectional study design using mixed methods of qualitative and quantitative. It provides detailed information concerning the study population and sampling methods used. The procedures for pilot study and data collection methods are described in depth. Details about the instrument, its reliability and validity together with data collection procedure are highlighted. Finally, the chapter presents the data analysis and shows how the issue of ethical considerations were addressed.

In chapter four, the demographic characteristics of the players are reported. The presentation and brief description of the main findings in the study are displayed. The emphasis was put on the intrinsic and extrinsic risk factors associated with injury occurrence. Factors contributing to injury recurrence and the players' perceptions about the social support and assistance they received during the rehabilitation process were highlighted.

In chapter five, the demographic characteristics of the coaches are presented. A presentation and brief description of the main findings concerning coaches' perspectives and role in returning injured players and helping them to cope are displayed.

In chapter six, the entire discussion focusing on the interpretation of the main findings in this study is presented. The intrinsic and extrinsic risk factors associated with injury occurrence and factors contributing to injury recurrence are discussed in depth comparing the findings with previous studies.

Chapter seven gives the summary of the study, presents the study's limitations and draws conclusions as well as recommendations and suggestions for practice and future studies.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

A review of literature regarding the factors associated with injuries in female soccer is presented in this chapter. It presents an overview of females and soccer, the prevalence, types, mechanism, nature and severity of the injuries. The predisposing factors, prevention and rehabilitation of the injuries are further highlighted. This chapter also contains literature regarding players' perceptions and coaches' perspectives on social support, assistance and returning injured players to sport activities.

2.2 Females and soccer

Soccer is the most popular team sports worldwide played on a rectangular field with net goals on either side. It is a rough contact sport associated with numerous activities including jumping, kicking the ball, tackling, turning, sprinting, changing pace and sustaining forceful contraction to maintain balance and control of the ball against defensive pressure of the adverse team (Landry et al., 2009; Tomas, Karim, Carlo & Ulrik, 2005; Davis & Brewer, 1993). At its inception, soccer was purely for men and as it progressively earned popularity among different people; females also joined and started to practice it. More than 40 million female soccer players are now registered by FIFA worldwide (Tegnander et al., 2008) and it is practiced more in developed than developing countries. In USA, first ranked in the world (FIFA, 2010), more than 7 million female soccer players are registered and this number is gradually increasing specifically among US student-athletes (Lahmander et al., 2004). Brazil was ranked second in the

world (FIFA, 2010). Although this sport is extremely popular in Brazil, no indications of the number of registered female soccer players are given. In the Netherlands, female soccer is the second most popular team sports with more than 90,000 registered Dutch female soccer players. Approximately 16,000 and 191,678 female soccer players are registered in Spain and England respectively (FIFA, 2010). Furthermore in Mexico, female soccer is on the rise and accounts for more than 14,000 registered female soccer players and Iran recognised 1,000 female soccer players. North Korea's female soccer team is ranked the fifth in the world and the same as China, only around 3,000 female soccer players are registered despite having hosted the first female's world cup and Beijing Olympic games in 1991 and 2008 respectively (FIFA, 2010).

In Africa different countries have different levels of participation in soccer among women. In South Africa approximately 50 000 players are registered (SAFA, 2004). In total contrast to this, although popularity of soccer among women is on the increase, only 360 female soccer players are registered in only one first division female championship in Rwanda (FERWAFWA, 2010). It is evident that participation in soccer by female players in both developed and developing countries is on the increase and therefore needs more investigations.

2.3 Prevalence and types of injuries

Several studies have proved that increasing soccer injury rates are directly proportional to increased popularity and participation (Hugglund, Walden & Ekstrand, 2009; Biedert & Bachmann, 2005). A number of studies investigated the prevalence of injuries in women soccer players and the results confirmed higher injury rate in games/matches than in trainings/practice sessions (Azubuike

& Okojie, 2009; Hagglund, Walden & Ekstrand, 2009; Giza et al., 2005). Several researchers also found a high rate of female soccer players being injured in games than in practices, 23.3/1000 match hours compared to 2.8/1000 training hours respectively (Faude et al., 2005) and almost the same results were found by Tegnander et al. (2008). Contrary to this, higher injury rates had been recorded during training than in games in the study conducted by Franck, Christopher and Thomas (2008).

Injuries among women soccer players have predominantly been confined to the lower extremities (81%) (Tegnander et al., 2008). Several researchers have confirmed that female soccer players are more prone to sustain injuries in the lower extremities than any other body parts (Franck et al., 2008; Faude et al., 2005; Giza et al., 2005). In a study conducted by Giza et al. (2004), it was found that more than 82% of all injuries sustained by female soccer players were acute and about 16% were chronic in nature. The injury recurrence rate in soccer players also seems to be high. In a study conducted by Hawkins and Fuller (1999), the soccer re-injury rate was up to 22% of all sustained soccer injuries and 12% of the injuries were reported to be associated with unrespected soccer game rules. Furthermore, they reported that youth players showed an increase in soccer injury rate over the second half of the season compared with the decreasing injury rate in professional soccer players counterparts but the rate of injuries in both players groups showed no significant difference of overall injury rate during training and competition sessions (Hawkins & Fuller, 1999). Hawkins et al. (2001) also reported that more than 78% of all soccer injuries resulted in at least one competitive match being missed and that the injury incidence varied throughout

the season. They reported that the training injury rate touched its highest level (peak) in July versus August for the match highest injury peak (Hawkins et al., 2001). Sixty three percent of all competitions reported significant injuries occurred towards the end of both halves, 7% of them were reported to be reoccurrence and the severity of the re-injuries to be greater than the initial injuries (Hawkins et al., 2001). On the other hand, injury risks were found to reach its highest rate in the first and last 15 minutes of the game reflecting the intense engagements in the opening period and the possible effects of fatigue in the closing period. The latter together with the areas of the pitch where possession of the ball was vigorously contested, specifically the attacking and defending zones close to the goal were reported to be highly associated with injury occurrence in soccer (Rahnama, Reilly & Lees, 2002). The incidence of soccer injuries on lower extremities was reported to be equally distributed on right and left legs regardless of the leg dominance. Among the reported major injuries, the majority of them were whether the knee ligaments and/or meniscal tears. The both traumatic and overuse injuries also controlled the leading front of all competition injuries specifically at the beginning of competitive season (Engström, Johansson & Tornkvist, 1991; Jacobson & Tegner, 2006). Several researchers documented the possible association between the player's position and their soccer injuries. These studies reported diverging findings and conclusions. Morgan and Oberland (2001) reported no link between the prevalence and severity of soccer injuries and the player's playing position. Conversely, midfielders were found to be more prone to suffer from soccer injuries than other players (Giza et al., 2005) and injury incidence was considerably high in defenders (9.4/1000 hours exposure)

and strikers (8.4/1000 hours exposure) compared with goalkeepers (4.8/1000 hours exposure) and midfielders (4.6/hours exposure) (Faude, Junge, Kindermann & Dvorak, 2006).

The ankle, knee and thigh were the most targeted parts of the lower extremities and ankle sprains together with anterior cruciate ligament (ACL) were the most commonly diagnosed injuries (Azubuike & Okojie, 2009; Ellen et al., 2008; Emery & Meeusse, 2006; Faude et al., 2005) than stress fracture, concussion, contusion, muscle strain, groin, back and head injuries respectively (Faude et al., 2005). It is evident that the prevalence of injuries in female soccer players is proportional to session demanding (match versus training) and the time of players' exposure to different events. Therefore, further investigations aiming to increase safety in female soccer participation need to be done.

2.4 Mechanism, Nature and severity of injuries

Most injuries occurred as result of direct contact with the player of the opposite team and/or teammates (DeLee et al., 2009; Ellen et al., 2008). Most of the time contact injuries occurred during tackling, being tackled and/or collision with other players (DeLee et al., 2009; Yard, Mathew, Sarah, Christy & Comstock, 2008).

Soccer is defined as a sport with high rate of injuries. Studies however revealed that, more than half of all injuries in female soccer players were due to tackles from the side (52%). The tackles from behind (11%) were found to be much less commonly involved in injury situations. This is probably because; it is considered more aggressive and dangerous and also results in a straight red card for the tackling player and immediate expulsion from the game. This tough punishment

results in players attempting not break this rule. Furthermore, one-footed (65%) and upper body (21%) tackle actions were most common. The tackled players looked more vulnerable to injuries (55%) but neither tackling players were not kept away from the injuries (45%) (Tscholl et al., 2007).

Alternatively, the non-contact injuries resulted from poor landing, sudden cutting, kicking the ball, sprinting, deceleration, changing pace and direction (Alenton-Geli et al., 2009; DeLee et al., 2009; Yard et al., 2008).

The most sustained injuries in female soccer were traumatic in nature (Moller-Nielsen & Hammor, 1989) and depending on the severity, injuries are classified in three different categories: Minor/Slight, Moderate and Severe/Major. Injury was classified minor/slight if an injured player was absent in training or competition 2 to 3 days; moderate if an injured player was absent in training or competition 4 to 7 days and severe/major if an injured player was absent in training or competition 1 week and above (Hawkins & Fuller, 1999). Furthermore, Morgan and Oberlaner (2001) classified the sustained soccer injury as incident (no time lost from training/competition), minor (less than 7 days of absence from training or competition participation), moderate (7 to 29 days of absence in training or competition participation) and major (more than 30 days lost from training or competition participation). Alternatively, Hockney (1994), diagnosed minor injuries as those instances where an injured player received only first aid on the field and continued the game/practice; a moderate injury as those instances where an injured player receives treatment off the pitch and continued the session and a severe injury when the injured player received treatment off the pitch and stopped the session immediately.

2.5 Predisposing factors

Various factors have been found to predispose soccer players to injuries generally and some were specific to female soccer players. These factors are grouped into two wide categories: Intrinsic and extrinsic factors as they affect athletes from inside or outside of the athlete's body, respectively. Some of the intrinsic factors have been proved to be gender-related which predispose more female than male athletes to sports injuries. These include female menstrual cycle, anatomical and hormonal factors (Biedert & Bachmann, 2005).

2.5.1 Extrinsic risk factors

a. Level of competition

The level of competition had been revealed to be an extrinsic risk factor for sports injuries. There is general consensus that the incidence of injuries is greater during competition than practice. These findings suggest that athletes may be more prone to aggressive risk taking behaviours during competition which may in turn increase the potential for injury.

Several studies have shown that the level of competition influences injury occurrence in all sports, particularly in soccer. Therefore, the level of competition highlights the huge difference of intensity and participation between the training and competition sessions with several studies highlighting the high incidence of injuries during matches than during training sessions (Murphy et al., 2003). Some injury incidence is much higher in sports like handball, basketball and ice hockey than in soccer and curiously lower extremities are more vulnerable even in hand sports (Seil et al., 1998; Messina, Farney & DeLee, 1999; Nielsen & Yde, 1989;

Ekstrand, Gillquist, Moller, Oberg & Liljedahl, 1983; Soderman, Alfredson, Pietila & Werner, 2001; Myklebust, Haehlum, Holm & Bahr, 1998). Currently, no study has been conducted to clarify the reason for this huge difference of injury rate in games/matches compared to training/practices. Based on the researcher's experience shared with soccer coaches and players, this difference is believed to be associated with an increased intensity of the event and the preset goal to be achieved. Most of the games are played at competitive level and the desire for winning the competition and/or not dropping back into the lower divisions make the players more psychologically motivated, determined to give their best. This differs from the game and practice events. The competition between players to be permanent players and not substitute players also puts pressure concerning better performance in the game. The opponent determines the level of the game, the strongest opponent makes the weaker one work hard on the pitch which increases the excitement and risk of injury. In the future, researchers should investigate scientifically the reason for the difference of injury rate in games compared to practices sessions.

b. Skill level

Several studies analysed the relation between skill level and injury and revealed contradictory findings. Peterson et al. (2008) found that young players with low skill level suffered more injuries compared with more skilled adult athletes. Furthermore, Chomiak, Junge, Peterson and Dvorak (2000) also found a high incidence of severe injury rate in low than high skilled athletes. A severe injury was defined as; one resulting in complaints lasting for more than four weeks, absence from sports for four or more weeks, or an association with more serious

damage to the musculoskeletal system (fracture, dislocation or damage to the visceral system) (Chomiak et al., 2000). Hopper, Hopper and Elliott (1995) conducted a study on risk factors for lower extremity and back injury in 72 female netball players. They reported high incidence of injuries in highest skilled female netball players (Hopper et al., 1995). It is extremely difficult to compare the results of these studies as they investigated different sports and most probably had diverse criteria of grouping skill levels. In addition, less skilled athletes may not compete for as long as those in high skilled level groups. Alternatively, high skill level groups may play at more aggressive intensity than low skill level thereby increasing the risk of injury. Further studies need to be conducted in the area of female soccer using a clear methodology and specific skill level categories to clarify the skill level influence on soccer injury occurrence. Furthermore, low and high skilled athletes should be clustered in separate clusts but with the same conditions of exposure to ensure the homogeneity of the results.

c. Shoe type

The association between the shoe type and ankle injuries is inconsistent. Milgrom, Shlamkovitch and Finestone (1991) in their study on 390 male military recruits, found no difference in ankle injury incidence between a group wearing combat boots during basic training compared with those wearing three-quarter height basketball shoes. Likewise, Barrett et al. (1993) also found no relation between the shoe types (low top, high top and high top with inflatable chamber) and ankle sprains in 622 basketball players.

Conversely, variation of sports ankle injury rate associated with shoe types had been shown in the study conducted by McKay, Goldie, Payne and Oakes (2001)

among elite and recreational basketball players which appeared to be 4 times higher in players wearing shoes with air cells in the heels compared with those wearing basketball shoes without air cell in the heels. The authors suggested that the increase of ankle injury rate in players with air cell heels shoes could be associated with decreased rearfoot stability (McKay et al., 2001). Lambson, Barnhill and Higgins (1996) in one prospective study, investigated the relation between cleat design and incidence of ACL tears in 3119 high school American football athletes participating on natural turf. They reported a significant incidence of ACL tears in athletes wearing edge cleat designs with longer irregular cleats positioned at the periphery of the shoe and smaller pointed cleats positioned interiorly than athletes wearing other cleat design types including flat, screw-in and pivot disk designs. The authors suggested that this difference in ACL tears depending on shoe types could be associated with an increased shoe to surface torsional resistance in those athletes wearing the edge cleats design. Several studies have investigated the role of sport shoes, ankle tape and brace in prevention of sports ankle sprains. However, less attention has been paid to investigate the effects shoe types play on sports ankle injuries. Furthermore, the role of the shoes in offering external ankle support is acknowledged, but factors other than support including traction, limitation of joint mobility and effect on proprioceptive input need to be evaluated in future studies (Barrett & Bilisko, 1995).

d. Ankle bracing and taping

Generally, literature agreed on the role of tape and brace in the reduction of the ankle injury rate in sports. This is due to ankle tape or brace which increases the kinesthetic awareness of ankle positioning and increase support to the ankle joint by limiting hindfoot motion, specifically inversion (Engström & Renstrom, 1998). Very limited studies therefore have been conducted to investigate the efficacy of tape/brace in protecting other joints so, further studies are recommended in future. Sitler et al. (1994) conducted a prospective randomised study of ankle brace use in 1601 military recruits playing intramural basketball. They reported a three times higher incidence of ankle ligamentous injuries in unbraced control compared to the braced group. Similarly, Tropp, Askling and Gillquist (1985) conducted a study on injury prevention on three subject groups: A one that wore ankle brace, one that underwent ankle proprioceptive disk training and an unbraced control group. Their study highlighted the low incidence of ankle sprain in both intervention groups; 5 and 3% in those who underwent ankle proprioceptive disk training and braced groups respectively versus 17% in the unbraced control group (Tropp et al., 1985). Furthermore, Surve, Schweltnus, Noakes and Lombard (1994) studied the effects of bracing on the occurrence of ankle sprains in 504 male soccer players and found high incidence of ankle sprains in unbraced soccer players with a previous history of ankle sprains than in the group wearing ankle braces. There was however, no difference in incidence of ankle sprains in players without previous injury between braced and unbraced groups (Surve et al. 1994).

Conversely, McKay et al. (2001) in their study reported no relation between the use of tape/brace and the incidence of ankle injuries in elite and recreational basketball players but mentioned that a subgroup wore ankle braces or used tapes for support. This suggested that there may have been inadequate statistical power to conclusively determine the relation between the use of ankle brace/tape and ankle injuries.

Practically the tapes and braces used in sports are in different forms, shapes and resiliency. Currently, no study has been specific on which type, form and/or resilient tape/brace is proved to be more effective to prevent sports injuries. Furthermore, the efficacy of tape/brace in reduction of sports injuries on other joints than the ankle remains unclear. This is suggested to be considered in further studies.

e. Playing surface

The effects of playing surfaces on injury occurrence should have had additional investigations. Literature posits that high incidence of injuries might occur on artificial rather than natural playgrounds. Several studies revealed that the high incidence of sports injuries on artificial turf was due to its increased stiffness and frictional force at the shoe surface interface with the playing surface (Inkelaar, 1994). Stiffness of surface affects impact forces and can result in overload to tissues such as bone, cartilage, muscle, tendon and ligament. Friction rather is necessary for rapid starting, stopping, cutting and pivoting in sports such as football and soccer. However, increased frictional force may contribute to increased incidence of injuries among athletes who play on artificial turf (Inkelaar, 1994). Furthermore, Powell (1987) in his study on national football league

athletes between 1980-1985, found that playing on artificial turf increased the incidence of knee , ankle and foot injuries compared with the natural grass. Moreover, Arnason, Gudmundsson, Dahl and Johannsson (1996) reported two times higher incidence of injuries on artificial turf compared with grass or gravel in 84 elite male soccer athletes.

Some studies revealed that the acute injury rate for matches played on grass did not differ from the matches played on artificial turfs. However, injuries received during matches played on artificial turf were likely to be more severe than those sustained on natural grass playgrounds; but overall the acute injuries were similar for artificial turf and natural grass (Steffen, Andersen & Bahr, 2007).

2.5.2 Intrinsic factors

a. Age

Several studies have been conducted to examine the age related influences on injury occurrence in sports, particularly in soccer. However, most of them produced contradictory results. Chomiak et al. (2000); Backous, Friedl, Smith, Parr & Carpine, 1988); Ostenberg and Roos (2000) and Lindenfeld, Schmitt, Hendy, Mangine and Noyes (1994) in their studies reported an increased injury incidence with increased age among soccer players. Ostenberg and Roos (2000) studied 123 female soccer players aged 14-39 years and found a significant increased risk of overall injuries in players older than 25 compared with the players younger than 25years. Similarly, Orchard (2001) in a study of risk factors for lower extremity muscle strains among Australian football players found that players older than 23 years were more likely to incur hamstring and calf strains

but age did not influence quadriceps strains in this study. Furthermore, a study conducted by Backous et al. (1988) on youth aged 6-17 years participating in summer soccer camp, reported that the injury risk doubled after the age of 14 years. A study carried out on injuries in recreational sports participants aged 9-59 years in Australia, Stevenson, Hamer, Finch, Elliot and Kresnow (2000) found 55% increased risk of injury in players aged between 26-30 compared to those younger than 26 and older than 30 years.

A study investigating risk factors of injuries on 1230 military recruits aged 17-35 sustained during basic combat training showed that the males aged 25-35 years old were at significantly increased risk of sustaining any injury of any type compared to the others but that age was not a risk factor for females (Knapik et al., 2001). Lindenfeld et al. (1994) therefore, reported in their study of injury incidence among indoor soccer players that males older than 25 years suffered the highest rate of all injuries compared with younger groups and female aged 12-15 years were at high risk of sustaining injuries than those younger than 12 and older than 25 years old.

Conversely, Peterson (2000) reported an increased injury risk in younger male soccer players (14-16 years) compared with those in 16-18 years age range. Similarly, in a study of ankle injury risk factors among elite and recreational basketball players, McKay et al. (2001) showed an increased risk of sustaining ankle injuries in young athletes (age mean 25.2 years) than in older athletes (age mean 28 years).

Several studies conducted on different sports with different backgrounds found age to not be a risk factor. Wiesler, Hunter, Martin, Curl and Hoen (1996) investigated the incidence of lower limb injury in 148 dancers aged 12-28 years old; Soderman et al. (2001) carried out a study on risk factors of injuries in Swedish female soccer players; Hopper et al. (1995) investigated risk factors for lower extremity and back injuries in female netball players; Bennell et al. (1996) carried out a prospective study of risk factors for stress fractures in 101 male and female track athletes and Chomiak et al. (2000) in their study on severe injuries among soccer players aged between 14-41 years old, reported that age did not influence the incidence of injuries; but they acknowledged the influence age has on type and severity of injury in different age groups.

Based on the literature investigated, concerning the age contribution to sports injuries, there is no doubt that age might be a contributing factor. However, thus far, the variations and different age groups judged to be most at risk, make these results hard to be compared and generalised because the methods used differed from sports, age group and injury investigated. Furthermore, several of the above mentioned studies focused on narrow age range which may have made it difficult to observe the association between age and injury. Additional research is needed on larger age distributions.

b. Sex/ gender

Sex has been believed to be a sports injury risk factor. This fact is mainly based on anatomical and physiological differences between male and female. In this regard, several studies have been conducted to find out the influence of gender based differences on sports injury.

Myklebust et al. (1998) in their study on ACL among Norwegian handball players found that females were five times at higher risk of sustaining ACL injuries compared with males. Furthermore, Gwinn, Wilckens, McDevitt, Ross and Kao (2000) also found that the incidence of ACL was higher in female than male military recruits participating in intercollegiate sports, code intramural sports and military training combined. In intercollegiate sports, female soccer players presented nine times higher the risk of sustaining ACL tears than male soccer players but there were no differences in injury risk factors between the two sexes among basketball or rugby players (Guinn et al., 2000). In code intramural sports, female soccer players were seven times more exposed to ACL injuries than their male counterparts but there were no significant differences in relative risk between male and female basketball players (Guinn et al., 2000). In military training, females had almost ten times the increased risk of having ACL injuries than males (Guinn et al., 2000).

Few studies have investigated the effect of sex on other specific body parts than knee and ACL. Zelisko, Noble and Porter (1982) found that female professional basketball players suffered 60% more overall injuries than males. Knee and thigh were the most injured parts. The commonest anatomical injured sites among both males and females were the ankles (Zelisko et al., 1982). Similarly, Backous et al. (1988) reported greater overall injury incidence for females than males in their prospective study of youth soccer injuries and the high rate of injuries also was twice as high in female than male military recruits (Knapik et al., 2001; Bell, Mangione, Hemenway, Amoroso & Jones, 2000). Hosea, Carey and Harrer (2000), investigated the incidence of ankle injuries among high school and

collegiate basketball players. They reported a high incidence of minor grade I ankle sprains among female than male collegiate basketball players with no difference between them for the more severe grade II and III ankle sprains.

In contrast, several studies found no difference in injury rates between male and female sports participants (Bennell et al., 1996; Baumhauer et al., 1995; Beynon, Renström, Alosa, Baumhauer & Vacek, 2001). Lindenfeld et al. (1994) reported that the overall rate of injuries was the same in male and female soccer players but the rate of ankle and knee specific injuries differed between them where males suffered twice as high the ankle ligament injuries and females twice as high the incidence of knee injuries (Lindenfeld et al., 1994). Trying to explain the reason for this gender related difference in rates of sports injuries, Hewitt (2000) concluded that it might be based on anatomical, hormonal and neuromuscular factors which differ from female to male (Hewitt, 2000). Biedert and Backmann (2005) found that the female soccer players were exposed to increased injury rate resulting from their wider pelvic bones and narrow intercondylar notch, increased femur internal rotation on tibia resulting in an increased ACL injury rate. In addition, the small size of ACL, increased Q-angle and hormonal effects on increasing joint laxity and joint ligamentous laxity with increased body mass index (BMI) were also highlighted (DeLee et al., 2009; Gherard et al., 2009).

Although it is clear that female players are at increased risk of suffering ACL injuries, the relation between sex and other injury types of the lower extremities is not clear. The influence gender has on sports injury occurrence on other body parts also need to be considered in further studies.

c. Phase of menstrual cycle

Several researchers suggest that hormonal and female menstrual cycles influence the risk factors of injury occurrence in sports due to physiological changes they cause to different structures within the female's body. Several studies divide the female menstrual cycle into different phases these are as follows: Days 1-7: Menstrual phase; days 8-14: Follicular phase and days 15-28: Luteal phase (Myklebust et al., 1998; Slauterbeck et al., 2002) and days 1-9: Follicular phase; days 10-14: Ovulatory phase; days 15-28: Luteal phase respectively (Wojtys, Huston, Boynton, Spindler & Lindenfeld, 2002).

To investigate its influences, several studies have been conducted based on female athletes self-reports on their menstrual cycles. The incidence of ACL injuries was higher in the luteal phase (n = 10) followed by menstrual phase (n = 5) compared with follicular phase (n = 2) in a prospective cohort study of ACL injuries conducted on 24 elite handball teams (Myklebust et al., 1998). The authors concluded that there may be an increased risk of suffering ACL sprains during the week before or after the start of the menstrual period (Myklebust et al., 1998). The authors also highlighted that among the 17 female handball players who sustained ACL sprains, eight of them used Oral Contraceptive Pills (OCP) and nine of them reported regular menses (Myklebust et al., 1998). This would rather negate the efficacy of oral contraceptive pills (OCP) on lowering the incidence of injuries in female athletes.

In a study by Slauterbeck et al. (2002) investigating the relation between ACL injury and the phases of female menstrual cycle among 37 female athletes. The first group (n = 21) provided saliva samples to determine the level of oestrogene

and progesterone accompanied with self-reported menstrual history; the second group (n = 10) provided only saliva and the third group (n = 6) provided only menstrual histories. The results found that 25 out of 37 injured their ACL during menstrual histories. The results found that 25 out of 37 injured their ACL during follicular phase, 1 during ovulatory phase, 11 during luteal phase. Five out of six among of the all 25 who suffered from ACL injuries were using OCP and contracted the injuries during their follicular phase. The authors concluded that there was a high incidence of ACL sprains during the follicular phase with a significant number of injuries on days 1 and 2, than other phases of the menstrual cycle (Slauterbeck et al., 2002). In the same way, OCP use showed no influence in reducing ACL injury. Wojtys et al. (2002) investigated the effects of menstrual cycle phases on ACL injuries using hormonal metabolite measurements based on urine samples in 56 female athletes. The study involved collecting urine samples, one within 24 hours of injury and another within 24 hours of the first day of athlete's next menstrual period. The authors noticed a high rate of ACL injuries during ovulatory phase in both OCP users and non-users (Wojtys et al., 2002). Various researchers have investigated the effects of OCP use on sports injury prevention in female athletes. They found however that, although OCP are minimizing premenstrual and menstrual symptoms in female soccer players, its effects on VO2 Max might predispose female soccer players to injuries (Benwell, White & Crossley, 1999; Mandelbaun & Putukian, 1999). Converse findings show that due to a decrease in symptoms during the premenstrual and menstrual cycle caused by the use of OCP, a low rate of injuries is observed (Möller-Nielsen, Jospers & Hammor, 1989; Gherard et al., 2009).

The findings are therefore inconclusive, further studies determining the levels of oestrogene and progesterone in the blood and its influence on sports injury occurrence might be conducted in future. Furthermore, the effects of OCP use on the VO2Max variation as predisposing factor and/or its contribution to soccer injury reduction should be the focus of future studies.

d. Previous injuries and inadequate rehabilitation

There is convincing evidence that previous injuries, especially if followed with inadequate rehabilitation, places athletes at increased risk of suffering the injury of the same type and location (Bahr & Bahr, 1997; Milgrom et al., 1991; McKay et al., 2001; Surve et al., 1994; Bahr, Lian & Bahr, 1997; Messina et al., 1999; Chomiak et al., 2000; Arnason et al., 1996). Several factors have been identified as being associated with the increased risk of re-injury. These include proprioceptive defects/functional instability, diminished muscle flexibility and joint movement, muscle strength impairment and imbalance, persistent ligamentous laxity/mechanical instability and the presence of localised scar tissue which increased discomfort (Engström & Renström, 1998). Research has indicated that inadequate rehabilitation or early/premature return to play could influence injury reoccurrence (Ekstrand, & Gillquist, 1983; Chomiak et al., 2000). The authors emphasised that an athlete who was improperly rehabilitated or not ready to return to a pre-injury level of competition (early return) was exposed to re-injure from minor to major injury of the same type and location within two months (Chomiak et al., 2000 ; Ekstrand & Gillquist, 1983).

There is convincing evidence in the literature that previous injury in conjunction with inadequate rehabilitation is a risk factor for re-injury of the same type and

location. Previous injury may lead to an increased risk of sustaining future injury. This is caused by contributing to muscular weakness and imbalance, impairment of ligaments and fear of re-injury that could make an athlete use altered muscle recruitment strategies and lose focus which result in an inability to focus on appropriate visual cues. The idea therefore highlights the importance and necessity of adequate rehabilitation and psychological support to build up the confidence and self-esteem of an injured player before she/he resumes the sporting activities.

e. Aerobic fitness

It seemed reasonable that the level of aerobic fitness would be a risk factor for injury because once fatigued, most of athletes alter their muscle recruitment patterns. This altered recruitment pattern in turn, may alter the distribution of forces acting on the articular, ligamentous and muscular structures. However, the relation between aerobic fitness and injury is unclear and probably associated with the different techniques used to quantify aerobic fitness.

Osternberg and Roos (2000) found no difference in fitness measures between those who sustained injury and those who did not. This was contrary to what was found by Chomiak et al. (2000) who reported an association of severe injuries and low aerobic fitness/poor physical condition in male soccer players.

Diminished aerobic fitness may cause fatigue leading to a reduction in protecting effects of musculature on skeletal structures. Unfortunately, these studies used different methods to characterise aerobic fitness making it difficult to compare the findings and necessitate additional research that use uniform methods.

f. Body size

Generally, many people think that body size might be a cause of multiple sport injuries for several reasons. Taller athletes would be considered as being more prone to suffer multiple sports injuries based on the law of physics that the higher the centre of gravity, the lesser balance and equilibrium. It is believed therefore that taller athletes would be exposed to frequent falls and other balance and equilibrium related injuries than the shorter athletes. On the other hand, the theories that fatter and higher BMI athletes would be more exposed to injuries. Researchers therefore carried out scientific studies to clarify the influence various athletes' body size might have on injury occurrence. Backous et al. (1988) conducted a prospective study of youth soccer players and reported an increased incidence of injuries among boys taller than 1, 65 metres compared with those shorter than 1, 65 metres. In the same study, they found that height was not a risk factor for injury for girls. Moreover, the high incidence of quadriceps injury was reported among Australian football players having a height lesser than 1, 82 metres compared with the taller players. However, height was not associated with hamstring or calf muscle strains and no association between the weight and lower extremity muscle injury was noticed (Orchard, 2001).

Conversely, Baumhauer et al. (1995) and Beynnon et al. (2001) reported no effect of height or weight on incidence of ankle injuries among collegiate athletes participating in soccer, field hockey and lacrosse. Bennell et al. (1996) also found no difference in weight, height, total lean mass or body fat among male and female track athletes who sustained stress fractures compared with those who did not. A study by Ostenberg and Roos (2000) did not find BMI to be a risk factor

for all injuries considered as a group among female soccer athletes or in dancers (Wiesler et al., 1996). Other studies also found no association between height/weight x 100 (Quetelet) and injury among high school football players (Prager, Fitton, Cahill & Olson, 1989).

The aforementioned studies used different techniques to represent body size, making it difficult to compare the findings and conclusively determine the association between body size and injury. Additional investigations that use a common measure to represent body size are needed.

g. Limb dominance

Several studies investigated the relation between limb dominance and injury. Baumhauer et al. (1995) reported that left limb dominant collegiate athletes participating in soccer, field hockey and lacrosse were more likely to incur ankle sprains than right limb dominant athletes. Ekstrand and Gillquist (1983) found that the dominant leg regardless of the right or left side, sustained significantly more ankle injuries (92.3%) than non-dominant side in male soccer players but there was no effect of limb dominance in those who sustained muscle strains. No effect of limb dominance on severe ankle and non-contact knee injuries in male soccer players was reported but the dominant leg had proven to incur significantly more contact knee injuries compared with the non-dominant leg (Chomiak et al., 2000).

The increased injury rate on the dominant compared with the non-dominant leg of soccer players could be explained by extreme solicitation in various specific activities. The activities include kicking, shooting, controlling and fighting for the

ball with the opponent which could explain the high incidence of contact and overall injuries of the dominant compared to non-dominant leg. Numerous studies conducted tried to relate the limb dominance with the injury occurrence but still the relation between limb dominance and injury remains unclear.

h. Flexibility

Flexibility is a component that is believed to be associated with injury in sports. Several theories and literature posit that the increased flexibility is directly associated with decreased incidence of injury in sports, including soccer. Flexibility of a joint is determined by the geometry of the articular surfaces, muscles, tendons, ligaments, and joint capsule laxity. However, the measurement of the effects each of these components offer to joint flexibility remains unclear (Krivickas & Feinberg, 1996). The major elements to determine joint flexibility include: joint laxity, muscle tightness and range of motion (ROM).

1. Generalized joint laxity

Generalized joint laxity has been proven to be a risk factor for injury in a prospective study of 123 female soccer players carried out by Ostenberg and Roos (2000). They reported that female soccer players who scored 4 and above were five times more exposed to incurring injury compared with those with lower generalized joint laxity (below four). The joint laxity in their study was measured using a Beighton Scale ranging from 0-9, with 9 being the greatest joint laxity. Similarly, Sodermark et al. (2001) reported three times higher the rate of injury in female soccer players with increased joint laxity (score five and above) compared to those with lower joint laxity (score below five). Thus far, they found no influence of joint laxity on overuse injuries (Sodermark et al., 2001).

Conversely, Godshall (1975) in an eight year study conducted on male high school football players, found no relation between generalized joint laxity and injury. Likewise, Baumhauer et al. (1995) and Beynnon et al. (2001) did not find generalized joint laxity to be an injury risk factor for ankle sprains among collegiate soccer, field hockey and lacrosse athletes. Krivickas and Feinberg (1996) prospectively studied the relation between muscle tightness, ligament laxity and lower extremity injury in 201 collegiate athletes and reported no relation between generalised joint laxity and lower extremity in females but a significant relation was found in males with decreased generalized joint laxity and ankle injuries, the joint laxity was measured using the Beighton Scale.

It is possible that gender/sex plays a role in the association between the generalized joint laxity and injury. It is however difficult to develop an approach that examines joint specific laxity without the influence of muscle contraction and stiffness and together with different ratios between males and females make the findings of these studies difficult to compare.

Various studies using different methods for measuring joint laxity were carried out and reported a significant relation between the increased joint laxity and injury (Ekstrand & Gillquist, 1983; Chomiak et al., 2000; Arnason et al., 1996). Joint laxity was determined based on clinical evaluation. Knee joint laxity was determined based on varus/valgus and anterior/posterior clinical examinations (Ekstrand, & Gillquist, 1983); anterior drawer, Lachman and valgus and varus stress test (Chomiak et al., 2000). Similarly, increased talar tilt as a result of increased joint laxity, was found to be associated with injury in sports (Glick, Gordon & Nishimoto, 1976; Beynnon et al., 2001).

A more reliable and less subjective method for measuring joint laxity should be used for more reliable measurements. However, the ambiguities on the influence joint laxity has on injury occurrence remain alive. Some think that joint laxity increases flexibility thus contributes to reduction of injury rate but others are with the opposing opinion. It is for these reasons that further studies using specific methods need to be conducted in the future.

2. Muscle tightness

Krivickas and Feinberg (1996) has introduced a new scale for assessing muscle tightness of hip flexors, hamstrings, quadriceps and gastrocnemius and they applied it in a prospective study of lower extremity injury among collegiate athletes. The findings of their study showed no relation between the increased muscle tightness and injuries of lower extremities in females contrary to males where the relation was significant (Krivickas & Feinberg, 1996). Knapik et al. (2001) used a sit and reach test to diagnose muscle tightness. They found muscle tightness to be associated with injuries in male military recruits but not so for females (Knapik et al., 2001). This was contrary to what was reported by Arnason et al. (1996) who found no difference in muscle strain injury rate between the positive and negative diagnosed muscle tightness in soccer players.

The findings of general injury studies and studies of influence of muscle tightness on ligament sprains are confounding because of research designs using various methods of measuring muscle tightness, diverse injury type and a variety of sports with different inherent risk.

3. Range of motion (ROM)

Few studies have been conducted to investigate the influence of ROM on injury occurrence. Soderman et al. (2001) reported a hyperextension of knee (> 90 degrees) and eversion/inversion of the ankle to be risk factors of injuries on lower extremities in female soccer players (Soderman et al., 2001).

i. Muscle imbalance

Muscle strength is a required component to produce and cope with sport specific demands. Muscle imbalance however has been underlined to be associated with various types of injuries in soccer and other sports. Soderman et al. (2001) proved that decreased ratio of hamstring to quadriceps strength, influenced traumatic leg injuries and increased hamstring ratio to quadriceps influenced overuse injuries in female soccer players. Similarly, Ekstrand and Gillquist (1983) reported a high incidence of non-contact knee injuries in more reduced quadriceps strength at 30 and 180 degree on the injured leg compared with the uninjured one in male soccer players. Contrary to this, Ostenberg and Roos (2000) found no influence of hamstring to quadriceps ratios difference with injury occurrence (Ostenberg & Roos, 2000)

It is difficult to compare the findings of these investigations because different planes of motion testing speeds, sports with different inherent risk and various male to female ratios were studied.

j. Limb girth

Limb girth with the regards to the muscles' ability to stabilize and control the joints has been considered to be a risk factor of lower extremity injuries in female soccer players (Murphy et al., 2003). In a prospective study of risk factors for lower extremity stress fractures in male and female track athletes, the smaller gastrocnemius girth was found to predispose female athletes to injury but not for males (Bennell et al., 1996). Milgrom et al., 1991, reported an increased injury rate of the lateral ankle sprain with the increased gastrocnemius circumference in male military recruits and no association was reported between the thigh circumference and injury. The difference in limb girth could result from lean muscle mass, body fat content or bone geometry (Bennell et al., 1996).

Based on the previously discussed findings, it is evident that an association between the limb girth and injury exists. However, you cannot compare the results since the measurements were taken from different anatomical locations and different sports had been studied. Further studies measuring both limb circumferences at exactly the same distance from an anatomical landmark should be conducted. These studies should be conducted to compare the difference between male and female soccer players, to determine the accuracy of tye results.

k. Anatomical alignment

The anatomical alignment is determined by the association between the intersegmental joint forces and the structures that must resist them including articular surfaces, ligaments and musculatures. It has been proven that the relation between the lower extremity injuries with the anatomical alignment of the hip, knee and ankle is very strong (Murphy et al., 2003). The effect of anatomical

differences on sports injury occurrence has been investigated in several studies. Godshall, 1975; Laprade & Burnett, 1994 studied the association between notch width and ACL injury in 902 high school athletes participating in different sports and found a high incidence of non-contact ACL injuries to be associated with decreased intercondylar notch width in both male and female athletes but no significant difference in those who suffered contact ACL injuries compared with those who did not.

In these studies, a notch width index (NWI) was calculated by dividing the width of the intercondylar notch by the width of the distal femur at the level of the popliteal groove based on radiographic measures (Godshall, 1975; Laprade & Burnett, 1994).

They concluded that a decreased femoral intercondylar notch width is a risk factor for ACL injury. However, it remains unclear whether this is due to a small ACL and corresponding decreased material properties of the ligament or mechanical impingement as a result of reduced notch width (they all studied athletes from different sports). Similarly, variations of anatomical body alignment were also associated with injuries of other body parts. Cowan et al. (1996) took measurements of coronal and saggital knee alignment, Q angle, and leg length discrepancy in 246 male military recruits and reported a high incidence of injuries in those with severe valgus alignment and a Q angle greater than 15 degrees compared with rest of the group. Beynnon et al. (2001) also reported an increased tibia varum to be a risk factor for ankle sprain in females but not in males.

There is no agreement in literature about the characterization of abnormal alignment or the methods of measuring it. Thus, it is rather difficult to compare the results since these studies differ in anatomical structures measured, statistical analyses used and sports investigated.

1. Foot morphology

Foot morphology plays an important role and determines the relation between the ground reaction force and the axes of rotation of the ankle, knee and lower extremity as well as the corresponding forces developed on these structures (Murphy et al., 2003). No study has investigated the effect of foot morphology on soccer injuries but some studies were conducted to investigate the relation between foot morphology and injury. Dahle, Mueller, Delitto and Diamond (1991) and Cowan, Jones & Robinson (1993) conducted a study on 55 athletes participating in American football and cross country running to investigate the relation between foot types and occurrence of knee and ankle injuries. They reported a high incidence of knee injury in those who were classified with pronated or supinated foot types but no relation was found between foot type and incidence of ankle injury (Cowan et al., 1993; Barrett et al., 1993; Dahle et al., 1991)

Foot type was assessed during stance and classified as pronated, supinated or neutral using three criteria: calcaneal inversion/eversion, presence or absence of medial bulge at the talonavicular joint and visual assessment of a line joining the medial malleolus, navicular and first metatarsal-phalangeal joint (Cowan et al., 1993; Barrett et al., 1993; Dahle et al., 1991).

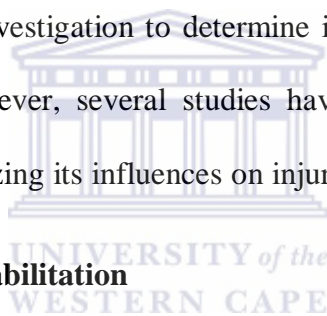
2.6. Nutrition

Other predisposing factors to injuries in female soccer players include nutrition. Poor nutrition including low carbohydrate calorie intake and improper fluid replacement in athletes predispose them to fatigue and dehydration related injuries. Studies however revealed that the alternating fast and slow running performed by soccer players during their practices/games can easily deplete their leg muscles of glycogen stores. The 90 minutes duration of a soccer match are more than enough to empty leg muscles of 90% of their glycogen in one match. It results therefore in extreme muscle fatigue and low performance level which make soccer players unable to cope with the high game demands and predispose them to injuries. (Anderson, 1994). The carbohydrates calorie intake and fluid imbalance play a vital role specifically in soft tissue injury occurrence (Anderson, 1994; DeLee et al., 2009). Alternatively, a 2400 to 3000 carbohydrate calorie intake per day and a 600 calorie intake two hours prior to the start of a match/training, coupled with adequate fluid replacement, seems to significantly lower the rate of soft tissue injury occurrence in female soccer players (Anderson, 1994; DeLee et al., 2009). These authors have also shown the negative influence of certain fluids such as juices, caffeine containing beverages and alcohol. A soccer player loses two to five litres of sweat during a match thus, the authors recommended a specific set of guidelines for fluid replacement before, during and after training sessions and matches as the following:

- *Before session/exercise:*
 - *500 ml (17 ounces) of fluid 2 hours before exercises*
 - *8 to 16 ounces of fluid 30 minutes before exercises*

- *During exercises:*
 - *4 to 8 ounces of fluid every 15 to 20 minutes during exercise with sports drink in sports lasting more than 1 hour or*
 - *14 to 40 ounces of fluid per hour depending on sweat rate.*
- *After exercises:*
 - *24 ounces of fluid every pound lost during exercise to achieve normal hydration within 6 hours after activity (Anderson, 1994; DeLee et al., 2009).*

It is clear that specific gender-related predisposing factors are unavoidable and requires sophisticated investigation to determine its influences to the occurrence of soccer injuries. However, several studies have to be done to establish the possible ways of minimizing its influences on injury occurrence.



2.7 Prevention and rehabilitation

Several authors investigated sports injuries and concluded that soccer injuries can be prevented and /or minimised but reported that there is no specific and successful single injury prevention programme which can stand independently. Therefore, a multi-model intervention programmes can result in general reduction of soccer injuries (Junge & Dvorak, 2004). Thus, 75% of all soccer injuries are preventable and the success of this relies on identifying the mechanisms of injury. The following has to be respected: strict adherence to game rules, pre-season screening and conditioning, proper training, warm up, cool down, stretching, strengthening, use of protective equipment, taping and bracing, controlled rehabilitation, strict correction and supervision of doctors and physiotherapists

(Ekstrand et al., 1983; Cross, 1993). A sport participant needs at least minimum physical, physiological and psychological requirements to cope with the demands of competition and the risk of injuries. The individual intrinsic and extrinsic factors influence injury occurrence are controlled through proper training, equipment and conditioning (Larson et al., 1996).

In practice, sports participants routinely believed that pre-participation warm up, stretching, strengthening and cool down regimen is enough to prevent soccer injuries by increasing joints ROM, muscles strength and flexibility needed in the practice of soccer.

2.7.1. Stretching

Three types of stretching are commonly used in the area of sports: static stretching is the most commonly used and believed to be the safest. It is performed by placing the muscle in its lengthened position and holding it there for 30 to 60 seconds (Shrier, 1999); dynamic stretch consists of controlled body movement that take the limb to the limits of its ROM (Shrier, 1999); ballistic stretching is characterized by rapid movements and bouncing, it is discouraged for most sports as during this types of movements the muscle has a greater stiffness and resistance to stretch predisposing it to muscle fibre injuries (McCullough, 1990); and proprioceptive neuromuscular facilitation (PNF) stretching which uses combinations of alternating contraction and relaxation of the muscle groups (Shrier, 1999).

It is highly recommended in clinical practices and suggested that pre and post-exercise stretching can enhance performance and prevent injuries by increasing flexibility and ROM (Brukner & Khan, 2004). The safest and most effective time

to stretch in order to increase the length of muscle and improve the ROM is just after exercise as soft tissue is more elastic and more pliable to be lengthened (Allerheiligen, 1994). However, recent studies have proved otherwise. It has been discovered that the commonly used and believed to be safest static stretching, has negative effects on stretched muscles. It impairs the muscle motor unit activation during early stage of deficit and contractile force throughout the entire period of deficit. As consequence, static stretch impairs the voluntary strength of the entire muscles. To minimise these negative effects, it is suggested that a static stretching might be performed an hour prior intense sporting activity involvement (Fowles & Sale, 1997; McHugh & Cosgrave, 2010). Moreover, the routinely used stretching techniques have also been proven to decrease blood flow within the tissues creating localised ischemia and lactic acid build up due to their prolonged static hold. They produce irritation and injury of local muscular, tendon, lymphatic as well as neural tissues similar to the effects and consequences of trauma and overuse syndromes (Mattes, 2000). The active isolated stretching (AIS) method is now believed to be more effective in injury prevention and encouraged to be performed before and after the match/training since it prepares the tissues by increasing the local blood flow, oxygen and nutrition to the tissues before activity and flushes out the waste products and lactic acid easily after the session (Mattes, 2000).

2.7.2. Warm up

It is defined as a period of preparatory exercise in order to enhance subsequent competition or training performance. It is aimed to play a significant role in soccer

injury prevention by preparing the muscles, joints, heart and mind for safe physical activity (Herbert, 2002; Kannus, 1993).

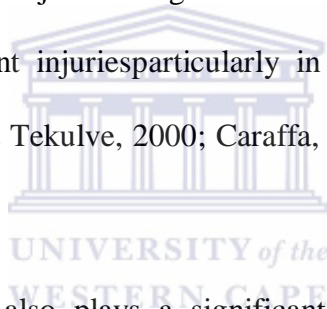
2.7.3. Pre-season examination

It provides the opportunity to analyse the factors predisposing players to injury and can minimize its influence to injury occurrence through corrections in training and conditioning (Larson et al., 1996; Ekstand, 1994).

FIFA Medical Assessment and Research (F-MARC) has developed an injury prevention programme “11+” injury prevention programme that has been proven to prevent severe sports injuries up to 50% and general injuries by a third (FIFA, 2009).

This programme consists of: eight minutes of six running drills; ten minutes of six strength, plyometric and balance exercises and two minutes of three further running drills. The programme is believed to warm up the whole body in preparation for the movement patterns which are used throughout a soccer match. The strength plyometric exercises are designed to improve the links which can contribute to suffering common soccer injuries, such as hamstring strains and ankle sprains by concentrating on strengthening the core muscles and legs with emphasis on eccentric hamstring and explosive strength. Balance exercises are also incorporated to improve proprioception, the awareness of the positioned body which can help to reduce the injury. As result, the female youth football teams using the 11+ as standard warm up had significantly lower risk for injuries than teams that warmed up as usual (FIFA, 2009).

Rehabilitation plays a significant role in female soccer injury prevention and management. A proper rehabilitation programme begins with proper diagnosis and might include a functional progression through a systematic programme of physical reconditioning involving reestablishment of intact articulations and muscles, pain-free joints and muscles, joint flexibility, muscular strength, endurance, speed with integrated and coordinated movements and cardiovascular endurance (Knight, 1985). Proprioceptive training has been proven to be effective not only in rehabilitation of both operative and non-operative soccer injury management but also, together with pre-season conditioning, considerably reduce the incidence of soccer injuries in general. These include ankle sprains and anterior cruciate ligament injuries particularly in female soccer players (Heidt, Sweeterman, Carlonas & Tekulve, 2000; Caraffa, Cerulli, Progetti, Aisa & Rizzo, 2007).



Adequate rehabilitation also plays a significant role in female soccer injury control as recurrence of more injuries are commonly associated with early return to sporting activities, a positive sign of inadequate rehabilitation (Gammons & Evan, 2010; Hawskins & Pollard, 2010; Mark & Amstrong, 2010). Various studies have also revealed that early return to sport activities following injury recovery, is mostly associated with huge pressure accompanied by deadlines for injured players to return to sporting activities. The players are further alienated because of lack of required social support and assistance from coaches, teammates and other rehabilitation specialists (Bianco, 2001; Johnston & Carroll, 1998). Such negative feelings therefore result in increasing personal pressure for injured players, contributing to the early return to training and competitive sporting

activities predisposing the players to re-injuries (Williams & Andersen, 1998). Studies have highlighted the important role that coaches can play in the rehabilitation process towards a complete recovery of players with injuries. The full and complete rehabilitation team might have a nurse, orthopaedic surgeon, physiotherapist, team coach and fitness trainer, occupational therapist, nutritionist and psychologist (Williams et al., 2000). Each member might maximise his/her requirement and the collaboration in intervention, as the team enhance the quality of rehabilitation given to injured players therefore limiting early return and minimising re-injuries. Furthermore, these studies have highlighted that the medical practitioners including physiotherapists and doctors are the appropriate persons to take the final decisions for injured players to return to sporting activities (Podlog & Eklund, 2007; Andersen, 2001; Bianco, 2001; Bianco & Eklund, 2001; Johnston & Carroll, 1998; Gould, Udry, Bridges & Beck, 1997).

2.8 Players' perceptions and coaches' perspectives on social support, assistance and returning injured players to sport activities

Injury is the most stressful event an athlete may face in his/her sporting career which causes injured athletes to spend some time off specific sporting activities, depending on the type and severity of the sustained injury. Returning injured athletes to sporting activities is the last stage of the rehabilitation process. Returning athletes, mostly experience negative thoughts and fears associated with re-injury, the ability to perform up to pre-injury levels, pressure to meet specific deadlines, competition anxiety, unnecessary focus on the injured body part, isolation from teammates and training partners, fear of lagging behind in fitness levels, losing or gaining a spot on the team and struggling to regain the technical

skills and ability which increase the risks of re-injury (Bianco & Eklund, 2001; Williams & Andersen, 1998). To overcome the effects these negative thoughts and experiences impose on returning athletes' well-being and performances, coaches as individuals who are working in close contact with athletes have a significant positive impact upon the quality and experience of an athlete's injury recovery efforts (Podlog & Eklund, 2007). To succeed this, social support and assistance provided mainly by rehabilitation specialists (physiotherapists and medical doctors), teammates and coaches were proved to be effective for the stress with injury recovery and rehabilitation to prevent return to sport difficulties and re-injury (Andersen, 2001; Bianco & Eklund, 2001).

The consistent social support and assistance provided to meet the injured athletes' needs were more effective and accurate to provide reassurance about getting better, keeping things in perspective, focus on future opportunities and encouraging injured athletes to adhere to rehabilitation programmes (Bianco & Eklund, 2001).

The findings of the aforementioned studies clearly demonstrated that rehabilitating an injured athlete might not be a task of specified rehabilitation specialists alone rather, teammates and coaches should also play an immeasurable role by timely, effectively and sufficiently providing a needed social support and assistance.

Furthermore, coaches recognised their role in assisting returning athletes to resume sporting activities and cope by adopting various forms of assistance

including individual training sessions, keeping athletes involved in sport team activities and providing social support (Podlog & Eklund, 2007).

Individual training provides coaches with opportunities to monitor returning athletes' activities and to introduce skills in a gradual progressive fashion. It also allows coaches to assess returning athletes' levels of physical conditioning and recovery status to give an athlete skill-related feedback and to help rebuild confidence. Individual training sessions finally help to remind the athletes that coaches were concerned about their personal well-being and it provides a clear indication to the athletes that coaches were willing to invest time, effort and energy into helping athletes achieve their goals (Podlog & Eklund, 2007).

The individual training sessions generally benefit both coaches and returning athletes. It benefits the coaches because it provides them with enough time to follow and guide the activities and progress of returning players. It helps returning players to recuperate the pre-injury fitness levels which will help them rebuild the confidence and cope. If respected and carefully implemented, the individual training sessions protocol would sufficiently minimise all risks associated with returning players' injury recurrence. Unfortunately, the wide gap concerning proper planned gradual progressive training sessions that would safely re-integrate returning athletes from injuries, remain unfilled. Future studies therefore need to install a well planned step-by-step plan of action to boost athlete's skills, adaptation and re-integration levels especially if returning from injuries with prolonged absence from the sporting activities.

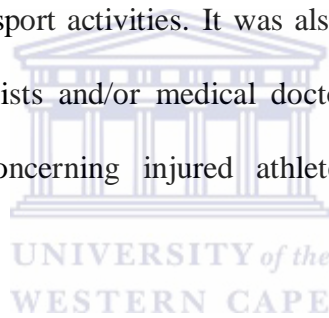
Keeping athletes involved in sport team activities during the injury recovery and rehabilitation process was perceived as helpful in assisting athletes once they returned to sport by providing them with the necessary social, educational and physical benefits. The social benefits were achieved by eliminating alienation and isolation injured players may feel by continually involve them in team's activities with their teammates and training partners which would facilitate a safe return to sport. It helps to ensure that injured athletes were up to date with team tactics and game plans which will allow easy and quick re-integration into the squad after the injury. Continued involvement also gives an opportunity between both injured and non-injured players to teach each other about what has to be done to successfully return an athlete following injury (Podlog & Eklund, 2007).

It is evident that continued involvement eradicates the negative thoughts, experience, alienation and isolation and it influences injured athletes' well-being and confidence. Thus, enhancing relationships between the injured players and the rest of the team members. It therefore results in injured athletes' easy adherence to rehabilitation leading to a positive recovery outcomes and re-integration.

Taking an interest in athletes by simply listening to their concerns was believed to be important for maintaining a positive coach-athlete relationship. The use of goal settings, organizing matches against lower calibre opponents and arranging meetings with sport psychology consultants (tangible) would help athletes rebuild confidence ensuring that they were psychologically healed and ready to achieve their goals (Podlog & Eklund, 2007).

All coaches indicated that before athletes could begin sports trainings, medical clearance from the physiotherapist or doctor might be presented (Podlog & Eklund, 2007) but under some other circumstances, coaches decisions to return injured players were influenced by player's status; where starters were returned faster than substitutes and/or benchers; and the ahead game; close game versus clear win/loss were considered as the major factors influencing coaches to return an injured athletes from injury (Flint & Weiss, 1992; Vergeer & Hogg, 1999).

The findings of the above studies highlighted the need of a complete rehabilitation team and respect between the team members in properly dealing with returning injured players back to sport activities. It was also noted that only rehabilitation specialists (physiotherapists and/or medical doctors) were the right persons to make final decisions concerning injured athletes and their return to sport activities.



CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter explores the methods and procedures used to collect data in this study. It describes the research setting, study population, study sample, study design and the procedures used to collect data. The issues of ethical consideration relating to the study are also reported.

3.2 Research setting

Rwanda is an African country in the Great Lakes Region with a surface area of 26,338 Km² (UNICEF, 1998). Rwanda is a member of African Confederation of Football (CAF) and has been affiliated to the International Federation of Football Associations (FIFA) since 1976 (CAF, 2004; FIFA, 2003). Soccer in Rwanda is predominantly for males and is ranked 107th in the world. Fédération Rwandaise de Football Association (FERWAF) is the national board controlling soccer for both males and females countrywide in Rwanda. Female soccer is only played in the first division at national level which consists of 12 teams and the majority of them originate from urban areas. These teams are all similar with regards to areas that they draw their players from as well as players' age and background. This study was conducted in different regions of Rwanda depending on where the different female soccer team's training camp is located.

3.3 Study design

The study was a descriptive cross-sectional study design using both qualitative and quantitative methods to investigate factors associated with sports injuries in female soccer players. The reasons for combining both qualitative and

quantitative methods were to assess different research objectives with optimal possibilities to generalise the results and generate a more rigorous methodologically sound study (Creswell, 2009). This study design is best suited to studies aimed at finding the prevalence of a situation, problems, attitudes or issues as it requires only one contact with the study population (Kumar, 2005).

3.4 Population and sampling

Female soccer in Rwanda is organised and controlled by FERWAFWA. For the 2009-2010 season, only one division of female players (12 teams) were registered at FERWAFWA (FERWAFWA, 2010). All 12 teams in this division were approached to participate in the study. Each of the registered teams consists of 25-30 players and 3 coaches. The head coach in each team was approached for participation in the study as he/she is the one making the final decisions regarding the team. Therefore, the total population of 300-360 players together with 12 coaches were approached for participating in the study.

3.5 Data collection methods

3.5.1 Self-administered questionnaire

To address the first 4 objectives of the study, a self-administered questionnaire using closed-ended questions was used to collect data. This instrument has been used in previous research on female soccer players (Bennett & Fawcett, 2006). The instrument requests for socio-demographic data such as age, occupation, player position, number of years participating in soccer. Furthermore, the instrument requests for information regarding previous injuries sustained. Information such as time of injuries, mechanism and location of injuries,

completion of training or competition at the time of injuries were collected. In addition, information regarding surface conditions for training or competitions at the time of sustaining the injury, use of protective equipment and details regarding menstrual cycles and oral contraceptive use were requested. The data regarding injured players' perception of the social support provided by their coaches during rehabilitation was also collected. The items used for this section requests participants to rate their perceived support regarding injuries in 6 areas as defined by Richman, Rosenfeld and Hardy (1993).

Furthermore, specific measurements were taken at the time of data collection. Body weight and height of each player was taken. Joints had been measured to check for joint laxity using the assessment criteria as outlined by Carter and Wilkinson (1964). The joints included were the elbow, knee and ankle. Excessive range of motion was ranged as hyperextension of elbow (> 10 degrees), hyperextension of the knee (> 10 degrees) and dorsiflexion of the ankle joint (> 30 degrees). Passive opposition of the thumb to the flexor aspect of the forearm together with passive hyperextension of the fingers so that they lie parallel with the extensor aspect of the forearm tests were also used to confirm joint laxity (Carter & Wilkinson, 1964).

3.5.2 Face-to-face interviews

To address the last objective of the study, face- to -face structured interviews was conducted with coaches to explore their perspectives. An interview guide was used to obtain information regarding coaches' perspectives on the return to sport of injured players, their role in the decision making to return players to training

and competition and their role in assisting returning soccer players from injury (Eklund & Podlog, 2007).

3.6 Validity and reliability

To ensure that the instrument is reliable, a pilot study with 20 female soccer players participating at Provincial level was conducted. The instrument had been re-administered to the same group of players two weeks later to check the consistency of the answers. The Spearman's correlation coefficient was ranged between .927 and 1.00. This score was strong enough to ensure the validity and reliability of the instrument to be used in collecting necessary information in soccer related injuries. The pilot study was also used to check for face validity of the instrument. Participants had been invited to discuss the questions after completion of the questionnaire. Furthermore, the pilot study helped to assess the understandability and the time taken to complete the questionnaire and to see if the questionnaire responds to research objectives. The research questionnaires were translated to French and Kinyarwanda as the commonest used languages by participants and thereafter, two independent translators translated them back from Kinyarwanda and French to English. This further enhanced the validity and reliability of the tools understandability by the participants. The questionnaire was then sent to experts in the field of female soccer injuries to ensure content validity. The tools were appreciated as they provide uniform information assuring the comparability of data and require fewer interviewing skills than an unstructured interview (Kumar, 2005).

3.7 Trustworthiness

Trustworthiness is a preferred method in qualitative research since it allows findings to reflect the reality of experience. It also provides participants with the opportunity to review the researchers' interpretation of the data (Lincoln & Guba, 1985). The trustworthiness of the study is therefore evaluated through credibility, transferability, dependability and confirmability in the collected data to demonstrate the validity and reliability of the qualitative research.

Trustworthiness of qualitative data was measured by credibility which was determined by the match between constructed reality of the participants and the reality presented by the researcher (Lincoln & Guba, 1985). Several steps were considered to build credibility: prolonged engagement and persistent observation; member checks by giving feedback of the data to participants so that they could comment on accuracy of the recordings; responses were transcribed verbatim and independent researchers were asked to read through the transcripts and generate the themes.

3.8 Procedure

Ethical clearance from the UWC Research Grants and Study Leave Committee was sought and obtained. Permission from the Ministry of Sports, FERWAFWA and team Managers in Rwanda was guaranteed before the beginning of data collection process. The researcher explained the relevance and the importance of the study, to players and coaches and thereafter invited them to participate in the study. For more clarity and understandability, participants were given opportunities to ask questions and satisfying answers were given. All this information was available in a written information sheet. Written informed consent was obtained from

players willing to participate in this study. Each coach agreed to be part of this study before any attempt was made to collect data. Two weeks had been used to train three research assistants and to introduce them to different team training camps where the data was collected. The research assistants were all qualified physiotherapists who were knowledgeable about soccer. This improved the confidence of the research assistants during the data collection process and helped them to provide more reliable explanations regarding the study whenever needed. Arrangements had been made with team management for an appropriate time to access the team players and coaches. The researcher and research assistants commenced with the data collection process after training and all permissions had been granted. Each team was visited twice, the first day was used to explain the procedure, clarify and distribute the questionnaires and the second day was used to collect the questionnaire, answering some questions from the participants, assessing and referring some cases accordingly and giving some advices.

3.9 Data analysis

3.9.1 Quantitative data

The quantitative data was analysed using the Statistical Package for Social Sciences (SPSS) version 18.0. Descriptive statistics were employed to summarise data used in the study. These consist mainly of frequencies, percentages, means and standard deviations. Inferential statistics such as cross-tabulations were used to test for significant associations between selected factors and injuries. The chi-square test (χ^2) was used to test for association between injury status and hypothesized factors at 5% level of significance ($\alpha = 0.05$).

3.9.2 Qualitative data

The analysis of the data from the interviews was transcribed verbatim to ensure its genuine authenticity. Independent researchers' views were considered to ensure a clear correlation between the reality of the participants and the presented information. Analysis had been done by reading through the transcripts several times, making as many headings necessary to describe all aspects of the content. All generated themes were grouped into broader categories to make sure that there were no participants' opinion omitted. To reduce the number of themes which were formed by researcher, similar categories were conflated to produce headings. The distinct categories but internally conveying the same opinion were grouped together (Marshall & Rossman, 1995). To ensure validity and reliability of the categorizing, the independent researcher was asked to read through the transcripts and generate the themes. Both the researcher and the independent researcher's developed themes were compared in the absence of the independent researcher. There were no major differences identified when the two lists of developed themes were compared. Finally the researcher focused on searching the most relevant explanations for the data and the linkage between the categories.

3.10 Ethical considerations

Ethical clearance was obtained from the UWC Research Grants and Study Leave Committee. Furthermore, permission was obtained from Ministry of Sports in Rwanda, FERWAFa and team managers in Rwanda. All participants were informed about the study and asked for their voluntary participation. The researcher explained the purpose of the study to all the participants in a written information sheet. Written informed consent was obtained from each participant.

The researcher ensured anonymity and confidentiality to all the participants. They had been assured that they had the right to withdraw from the study at any time.

The researcher also provided advice related to injury prevention and management and referred injured players to consult medical team practitioners and/or highly specialised hospitals for adequate injury management. The researcher will provide feedback of the results to all concerned institutions at the end of the study.



CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter contains and presents the results of this study. The results are presented and illustrated with the use of graphs and tables.

4.2 Description of study sample (N= 300)

A total of 300 female soccer players were approached to participate in this study. The average number of players per team was 25, ranging from 20 to 30 players. All registered players in the Rwandan first division were invited and accepted the invitation to voluntarily participate in the study thus resulting in 100% response rate. The mean age of the participants was 20.02 associated with a standard deviation (SD) of 3.138. The results are presented in table 4.1. Furthermore, measurements were taken from participants in the study. These included height, weight and joint range of motion (elbow, knee and ankle joints).

Table 4.1 Descriptive statistics of age, weight, height and ROM of the study sample

Variable	Mean	Standard deviation
Age	20.02	3.138
Height	165.64	3.779
Weight	59.92	4.962
Body mass index (BMI)	21.8	1.243
Years of experience	4.3	3.288
Joint range of motion		
Elbow	9.39	1.385
Knee	9.41	1.371
Ankle	25.38	2.319

4.2.1 Characteristics of the study sample (N= 300)

The mean number of years participants played soccer was 4.3 years with a standard deviation (SD) of 3.288. Other demographic characteristics, including years of experience and occupation are also illustrated. As indicated in table 4.2, only 8.3% of participants had participated in soccer on international level. Furthermore, 38.4% and 48% of players held striker positions at club and national team level respectively. 66.3% of the participants were starters in their squads and the majority of them were right-footed (68.3%). Students were the predominant occupation of the participants (62.7%).

Table 4.2 Characteristics of the study sample

Variable	Frequency (n)	Percentage (%)
Years of experience		
<1 year	53	17.7
1-2 years	43	14.3
3-4 years	81	27.0
5-6 years	56	18.7
>6 years	67	22.3
International participation		
Yes	25	8.3
No	275	91.7
Position in the club		
Defender	67	22.3
Midfielder	94	31.3
Striker	115	38.4
Goalkeeper	24	8.0
Position in the national team (n =25)		
Defender	6	24.0
Midfielder	5	20.0
Striker	12	48.0
Goalkeeper	2	8.0
Position in the squad		
Starter	199	66.3
Substitute	101	33.7
Leg dominance		
Right	205	68.3
Left	95	31.7
Occupation		
Student	188	62.7
House girl	100	33.3
Agriculturivator	12	4.0

4.2.2 Joint measurements and laxity (N= 300)

Joints ranges of motion were measured to determine joint laxity. As suggested by Carter and Wilkinson (1964), the excessive range of motion was ranged as hyperextension of elbow if it exceeds 10 degrees (> 10 degrees), hyperextension of the knee (>10 degrees) and dorsiflexion of the ankle if it exceeds 30 degrees (>30 degrees) were considered to be a positive sign of joint laxity. These measurements are outlined in table 4.2. Joints ranges mentioned above were dichotomised into joint laxity or no joint laxity (table 4.3).

Table 4.3 Joint measurements and laxity

Variable	Frequency (n)	Percentage (%)
Elbow		
< 10	254	84.7
> 10	46	15.3
Knee		
< 10	266	88.7
> 10	34	11.3
Ankle		
< 30	288	96
> 30	12	4.0

4.2.3 Use of protective equipment (N= 300)

Participants were requested to report on the use of protective equipment during training or competition. The majority of the participants (99.3%) reported that they have used protective equipment. All players considered their shoes as appropriate (100%) whereas 86% and 72% wore shin guards and never supported their joints to protect them from injuries respectively. See table 4.4.

Table 4.4 The use of protective equipment

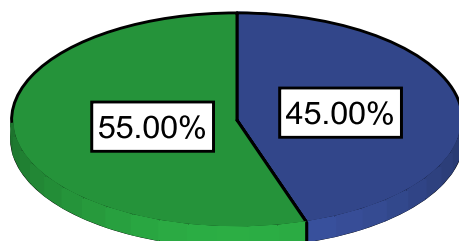
Variable	Frequency (n)	Percentage (%)
Use of equipment		
Yes	298	99.3
No	2	0.7
Appropriate shoes		
Yes	300	100.0
No	0	0.0
Shin guard use		
Worn	258	86.0
Not worn	42	14.0
Joint support		
Yes	84	28.0
No	216	72.0

4.3 Prevalence of injuries in Rwandan female soccer players (N= 300)

Participants were requested to report on injuries sustained in the last three seasons prior to the study. Almost half of participants (45%) indicated having been injured. This is illustrated in figure 4.1

Figure 4.1. Prevalence of injuries among Rwandan female soccer players

■ Injured
■ Not injured



4.3.1 Location of injuries to different body parts (n = 135)

Of the injuries sustained, 46.7% occurred during training and 53.3% during competition sessions. Participants further indicated the body parts that were injured. The results (table 4.4) indicate that ankle was the most common body part injured (23.7%) followed by the knee (14.8%) and thigh (14.1%).

Table 4.5 Location of injuries to different body parts

Body parts	Frequency (n)	Percentage (%)
Ankle	32	23.7
Knee	20	14.8
Thigh	19	14.1
Back	11	8.2
Leg	10	7.4
Head	9	6.7
Groin	7	5.2
Neck	6	4.4
Shoulder	6	4.4
Arm	5	3.7
Foot	4	3.0
Wrist	3	2.2
Toes	2	1.5
Fingers	1	0.7

4.3.2 Mechanism of injuries in Rwandan female soccer players (n = 135)

The mechanism of injuries was also reported. Contacts with other players were cited most often as mechanism for injuries. These included tackling (17%), being tackled (20.7%) and collision with other players (23.7%). See table 4.6

Table 4.6 Table illustrating the injury mechanism

Variable	Frequency (n)	Percentage (%)
Tackling	23	17.0
Tackled	28	20.7
Running	11	8.2
Shooting	11	8.2
Jumping	4	3.0
Landing	7	5.2
Heading	10	7.4
Turning	9	6.6
Collision	32	23.7

4.3.3 Training and competition surfaces and their condition when the injuries contrasted (n = 135)

Participants were requested to indicate the type of playing surface at the time of injury considering both training and competition. The majority of the participants indicated grass as a surface of more injuries for both training (87.3%) and competition (81.9%). A high rate of injuries was observed on dry (79.3%) than wet (20.7%) playing surface as outlined in table 4.7.

Table 4.7 Training and competition surfaces and their condition when the injuries contrasted

Variable	Frequency (n)	Percentage (%)
Training surface		
Grass	55	87.3
Artificial	8	12.7
Competition surface		
Grass	59	81.9
Artificial	13	18.1
Condition of the surface		
Dry	107	79.3
Wet	28	20.7

4.3.4 Time of injuries in both training and matches (n = 135)

Participants reported on the phase of training or competition during which the injury was sustained. The additional time (19%), last quarter of the first period (19%) together with the first quarter of the second period (19%) was reported to be the time of injuries during trainings. In the competitions, the second and the last quarters of the second period reported to be the time of injuries (19.4%) and (16.7%) respectively. See table 4.8

Table 4.8 Time of injuries in both trainings and matches

Time of injury	Training (n & %)	Match (n & %)
0-15 min	3(4.8%)	11(15.3%)
16-75 min	42(66.6%)	41(56.9%)
76-90 min	6(9.6%)	12(16.7%)
>90 min	12(19.0%)	8(11.1%)

4.3.5 Activities in which participants were involved in when contracting the sustained injury (n= 135)

The specific activity during which the injury was sustained was also reported. The participants were requested to indicate the activity they were involved in at the time of injury. The majority of the respondents highlighted the first team matches to be the most concerned activity with injury occurrence (34.8%). These activities are outlined in table 4.9.

Table 4.9 Activities in which participants involved in when contracting the sustained injury

Variable	Frequency (n)	Percentage (%)
First team game	47	34.8
Reserve team game	15	11.1
International game	12	8.9
Small sided game	6	4.4
11 vs 11 game	17	12.6
Practice drill	11	8.2
Specific exercise	13	9.6
Others	14	10.4

4.3.6 Recurrence of previous injuries (n= 135)

Participants reported on recurrence of their injuries. More than half of the injured players (52.6%) indicated a recurring injury as presented in table 4.10.

Table 4.10 Recurrence of previous injuries

Variable	Frequency (n)	Percentage (%)
Recurrent injuries	71	52.6
First injuries	64	47.4
Total	135	100.0

4.3.7 Treatment, severity and decision to resuming sporting activities from previous injury

Participants reported on the treatment received, severity, treatment duration and sessions and the person who made the decision regarding resumption of their sporting activities from their injuries. Of the injured, all received treatment for their injuries and the majority received only medical treatment (39.3%) while 28.2% and 19.2% either received traditional treatment or treated themselves respectively. The majority of them (85.9%) reported to have suffered severe injuries with the treatment session ranged between 1-4 sessions (80%). The severity was classified as minor if players spent 1-3 days of absence, moderate or severe if an injured player spent 4-7 days and 1-4 weeks and more of absence from sport activity participation (Hawkins & Fuller, 1999). Coaches (65.2%) and players themselves (16.3%) were reported to be responsible for decisions to resume sporting activities of injured players from their previous injuries. See table 4.11.

Table 4.11 Treatment and decision to resuming sporting activities from previous injury

Variable	Frequency (n)	Percentage (%)
Received treatment		
Yes	135	45
No	165	55
Kind of treatment		
Self	26	19.2
Traditional	38	28.2
Medical only	53	39.3
Physiotherapy only	2	1.5
Medical &Physiotherapy combined	15	11.1
Others	1	0.7
Treatment sessions		
1-2 sessions	54	40
3-4 sessions	54	40
5-6 sessions	9	6.7
>6 sessions	18	13.3
Severity		
Minor	2	1.5
Moderate	17	12.6
Severe	116	85.9
Who decides to resume the activities		
Myself	22	16.3
Coach	88	65.2
Coaching staff	9	6.7
Others	16	11.8

* No team has either a physiotherapist or a medical doctor.

4.3.8 Techniques to minimize soccer injuries (N=300)

Participants were requested to report the techniques they performed in their soccer practices to minimize the injury occurrence. More than half (59.7%) reported to always do stretching. Most of the participants (81%) reported to stretch for less than five minutes. Furthermore, 79% of the respondents always performed warm up in their soccer practice schedules. 41% performed warm up for less than five

minutes. Cool down was performed by half of all participants and the majority (49.7%) used less than five minutes to cool down and only did it sometimes (32.7%). Strengthening exercises were reported to be done by 70% of the participants and skills training (71%). The majority of the participants (83.3%) reported to not have a plyometric exercises programme. These are outlined in the table 4.12.



Table 4.12 Techniques to minimize soccer injuries

Variable	Frequency (n)	Percentage (%)
Warm up		
Yes	300	100.0
No	0	0.0
How often		
Always	237	79.0
Very often	39	13.0
Often	20	6.7
Sometimes	4	1.3
Never	0	0.0
How long		
<5 min	123	41.0
5-10 min	139	46.3
11-15 min	38	12.7
>15 min	0	0.0
Cool down		
Yes	150	50.0
No	150	50.0
How often		
Always	4	1.3
Very often	8	2.7
Often	40	13.3
Sometimes	98	32.7
Never	150	50.0
How long		
<5 min	149	49.7
5-10 min	1	0.3
11-15 min	0	0.0
>15 min	0	0.0
Stretching		
Yes	291	97.0
No	9	3.0
How often		
Always	179	59.7
Very often	61	20.3
Often	39	13.0
Sometimes	12	4.0
Never	9	3.0
How long		
<5 min	243	81.0
5-10 min	45	15.0
11-15 min	3	1.0
>15 min	0	3.0
Strengthening		
Yes	298	99.3
No	2	0.7
How often		
Always	210	70.0
Very often	46	15.3

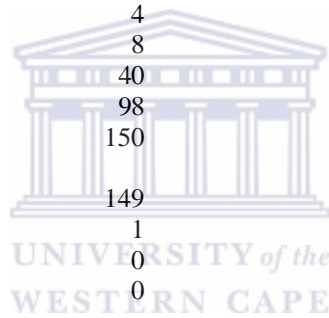


Table 4.12 Techniques to minimize soccer injuries (continued).

Variable	Frequency (n)	Percentage (%)
Often	23	7.7
Sometimes	19	6.3
Never	2	0.7
How long		
<5 min	40	13.3
5-10 min	22	7.3
11-15 min	105	35.0
>15 min	133	44.4
Skills training		
Yes	213	71.0
No	87	29.0
How often		
Always	4	1.3
Very often	45	15.0
Often	89	29.7
Sometimes	75	25.0
Never	87	29.0
How long		
<5 min	107	35.7
5-10 min	100	33.3
11-15 min	6	2.0
>15 min	0	0.0
Plyometric exercise		
Yes	35	11.7
No	265	88.3
How often		
Always	0	0.0
Very often	1	0.3
Often	3	1.0
Sometimes	31	10.3
Never	265	88.4
How long		
<5 min	35	11.7
5-10 min	0	0.0
11-15 min	0	0.0
>15 min	0	0.0

4.3.9 The pre-menstrual symptoms, menstrual phase and the use of OCP (N=300)

The participants were requested to indicate the menstrual phase during which the injury occurred as well as the presence of pre-menstrual symptoms and the use of

oral contraceptive as illustrated in table 4.8. 38.3% of the participants reported to have various pre-menstrual symptoms and 10.7% to use OCP. Of the injured 50.4% contrasted their injuries during the pre-ovulatory phase of their menstrual cycles as outlined in the table 4.13.

Table 4.13 The pre-menstrual symptoms, menstrual phase and the use of OCP

Variable	Frequency (n)	Percentage (%)
Pre-menstrual symptoms		
Yes	115	38.3
No	185	61.7
OCP use		
Yes	32	10.7
No	268	89.3
Menstrual phase		
Pre-ovulatory	68	50.4
Ovulatory	32	23.7
Post-ovulatory	27	20.0
Menstruation	8	5.9

4.4 Factors associated with injuries

Factors associated with injuries were studied by means of the chi-square test for independence. The results are presented in table 4.14. and 4.15. for intrinsic and extrinsic risk factors respectively. Concerning the intrinsic risk factors, age, weight, height, joint laxity and pre-menstrual symptoms were found to be strongly associated with injuries (p-value < 0.05), whereas no significant association was found between the BMI and injury status of participants.

Among the extrinsic risk factors, the results indicated that the use of OCP, competition level, use of protective equipment, player's position, preventing techniques and playing in the national team were found to be associated with injury (p-value < 0.05).



Table 4.14 Intrinsic factors associated with injury occurrence in Rwandan female soccer players (N = 300)

Variable	Injured (n & %)	Non-injured (n & %)	Level of significance
Age			P=0.000
14-17	9(3%)	67(22.3%)	
18-21	81(27%)	42(14%)	
22-25	42(14%)	48(16%)	
>25	3(1%)	8(2.7%)	
BMI			P= 0.105
< 18.5	0(0%)	4(1.3%)	
18.5-24.99	134(44.7%)	161(53.7%)	
>25.0	1(0.3%)	0(0%)	
Height			P= 0.016
150-160	11(3.7%)	30(10%)	
161-170	112(37.3%)	128(42.7%)	
>170	12(4%)	7(2.3%)	
Weight			P= 0.000
45-60	51(17%)	90(30%)	
61-75	84(28%)	75(25%)	
>75	0(0%)	0(0%)	
Joint laxity			
Elbow			P=0.008
< 10	106(35.3%)	148(49.3%)	
> 10	29(9.7%)	17(5.7%)	
Knee			P=0.037
< 10	114(38%)	152(50.7%)	
> 10	21(7%)	13(4.3%)	
Ankle			P=0.006
< 30	125(41.7%)	163(54.3%)	
> 30	10(3.3%)	2(0.7%)	
Recurrence			P=0.000
Yes	71(23.7%)		
No	64(21.3%)		
Premenstrual symptoms			P=0.000
Yes	75(25%)	40(13.3%)	
No	60(20%)	125(41.7%)	
OCP use			P=0.037
Yes	9(28.1%)	23(71.9%)	
No	126(47%)	142(53%)	

Table 4.15 Extrinsic factors associated with injury occurrence in Rwandan female soccer players

Variable	Injured (n & %)	Non injured (n & %)	Level of significance
Squad			P=0.000
Starter	113(56.8%)	86(43.2%)	
Substitute	22(21.8%)	79(78.2%)	
Techniques			
Cool down			P=0.049
Yes	59(39.3%)	91(60.7%)	
No	76(50.7%)	74(49.3%)	
Skills training			P=0.001
Yes	83(39%)	130(61%)	
No	52(59.8%)	35(40.2%)	
Protective equipment			
Shin guard			P=0.000
Worn	101(39.1%)	157(60.9%)	
Not worn	34(81%)	8(19%)	
Joint supports			P=0.000
Yes	19(22.6%)	65(77.4%)	
No	116(53.7%)	100(46.3%)	
Competition level			P=0.000
Trainings	63(21%)	237(79%)	
Games	72(24%)	228(76%)	
National team			P=0.001
Yes	21(84%)	4(16%)	
No	114(41.5%)	161(58.5%)	

4.4.1 Factors associated with recurrence of previous injury

As presented in table 4.16, the majority of the injured players reported a recurrence from the previous injuries (52.6%). The influence of some factors to injury reoccurrence was studied. The age was found to be associated with injury reoccurrence ($p= 0.000$) where the majority of the recurred injuries were seen in players aged between 18-21 years old (59.3%). More than half (51.6%) of the recurrent injuries underwent self and traditional treatment. Though the chi-square does not indicate a possible association ($p= 0.407$) but the received treatment witnessed a poor rehabilitation to cause injury recurrence. Players presented the premenstrual symptoms found to have suffered more than half (50.7%) of the all recurrent injuries in this study. See table 4.16.

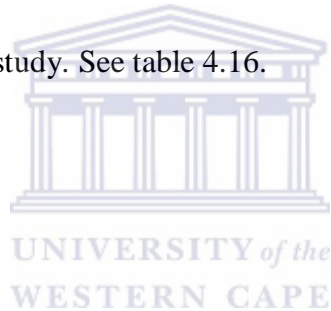


Table 4.16 Factors associated with recurrence of previous injury (n = 135)

Variable	Recurrent injury	First injury	Level of significance
Age			P= 0.000
14-17	3(2.2%)	6(4.4%)	
18-21	48(35.6%)	33(24.4%)	
22-25	18(13.3%)	24(17.8%)	
>25	2(1.5%)	1(0.7%)	
Received treatment			P= 0.407
Self	16(11.9%)	10(7.4%)	
Traditional	17(12.6%)	21(15.6%)	
Medical only	27(20%)	26(19.3%)	
PT only	2(1.5%)	0(0%)	
Medical & PT combined	9(6.7%)	6(4.4%)	
Others	0(0%)	1(0.7%)	
Premenstrual symptoms			P= 0.000
Yes	38(28.1%)	37(27.4%)	
No	33(24.4%)	27(20%)	

4.5 Social support and assistance received by injured players from their coaches during the rehabilitation process

Social support from coaches as perceived by players was measured. The mean scores and standard deviation (SD) for each subsection were illustrated in table 4.13. The maximum mean score for each subsection was 15 with standard deviation 0.000. Players perceived coaches showing care and comfort the most, followed by listening support and the least type of support was in the form of financial assistance. See table 4.17.

Table 4.17 Social support and assistance received by injured players from their coaches during the rehabilitation process

Variable	Mean	Standard deviation
Coach listening without being judgemental	12.4	2.217
Coach showing care and comfort	12.5	2.255
Coach providing challenges to evaluate attitudes, values and feelings	11.6	2.418
Coach acknowledgement and showing appreciation of the work and efforts	10.1	2.529
Coach challenges to motivate the thinking and increasing activity involvement	9.8	2.766
Coach providing financial assistance, products and gifts.	7.7	2.831

CHAPTER FIVE: QUALITATIVE DATA RESULTS

5.1 Introduction

This chapter contains the results of the interviews that attempt to address the fifth objective of this study which is: ” *To explore coaches’ perspectives on the return to sport of injured players, their role in decision making to return players to training and competition and their role in assisting returning soccer players from injuries*”. Interviews were guided by specific questions. The results will be outlined according to these questions. Themes for these questions will be illustrated with appropriate quotes from coaches.

5.2 Demographic characteristics

The qualitative data was collected from 12 head coaches of the 12 female soccer teams registered in the Rwandan first division for the 2010/2011 season. Among the 12 coaches, half were males and half were females. Only three of the 12 reported to be employed as permanent coaches and had fixed monthly salaries while the rest volunteered to coach because they enjoyed sport and wanted to promote Rwandan female soccer. Ten of the 12 coaches said they had only a coach assistant and this constituted their coaching staff. All of the coaches reported to have no qualified sport medical practitioner because the team was unable to afford to employ him/her. All the coaches had the minimum education level of at least secondary schooling (Matric) and three of them had a university qualification, with one in Sport science and education. Fewer of the coaches participated in soccer coaching seminars where certificates in coaching were awarded to them. The coaches’ age and marital status were not investigated.

5.3 After how long do you expect an injured player to return to training/competition after a previous injury?

Returning a player from previous injury is exciting procedure attracting attention from both coach and player. The predictable time a player may spend off the pitch due to injury was based mainly on factors such as type and severity of the suffered injury and the facility availability to handle it. In this study, it was clear from the interviews that none of the coaches had a fixed time for players to be off from training or competition. Three re-occurring themes were identified for this question. These included no fixed time, the time depends on type and severity of the sustained injury and the role or function of the injured player in the team (key player vs ordinary players) together with the game ahead influence the injured player's return to activities. The following quotes serve to illustrate these themes:

The coach **A** said: *“there is no fixed time when an injured player might be back to sporting activities, it normally takes 3 to 12 days unless a fracture occurred because it takes long to heal”*

Similarly, the coach **I** reported: *“I expect an injured player to come back 3 to 5 days later but sometimes, it takes longer depending on the type and severity of injury”*.

Furthermore, it becomes evident that the time off from training or competition depends on the type and severity of the injury, the role a player plays in the team and game ahead as illustrated in the following:

Coach **K** said: *“If we are in competition, I cannot wait for long and key players cannot miss so important games unless they are hospitalised, in*

case of a too serious injury, I can wait 1 to 4 weeks but hardly beyond this period”.

Similarly, the coach **J** stated: *“If we are in competition, I make them to come so quickly but if not, I give them chance to decide themselves but in all circumstances, key players are not allowed to miss important games unless so severe injury occurred to them”.*

Coach **B** answered: *“For me, an injured player could come back to activities even in the following day after an injury but practically, the return time depends on the type and severity of the sustained injury”.*

5.4 Who is responsible for decisions regarding return to sports? What influences this decision?

Coaches reported to be responsible for the final decision on returning previously injured players to sporting activities. The majority of coaches stated that they do not have qualified medical practitioners, therefore forcing them to make decisions on their own with no consultation. Even the one team nurse was consulted mainly only for advice but ultimately, it is the coach’s decision.

Coach **K** reported: *“I am responsible of all technical decisions regarding my team, so I decide whether an injured player can resume the sporting activities, when and how”.*

Coach **A** said: *“Myself I decide for an injured players to resume sporting activities since we have no sport medical practitioner in our team”.*

On the other hand, several coaches reported that players make decisions on their own concerning when to restart their sports activities after sustaining injuries.

Coach **D** stated the following:

“More often players themselves insist they should restart sports team activities especially when facing an away matches and/or when there is an interesting extra money on the won match, because it is paid to only those on that game’s list”.

In this study, the influences to return an injured player from a previous injury were attributed to both coaches and players. The majority of the coaches therefore agreed that the key players and the importance of the game to be played influenced much of their decisions for recalling injured players from their previous injuries.

As coach **I** stated: *“The competition influences most because we do not want to lose points and you cannot win a match if you left behind your key players”.*

However, players also played a role and had influence in decisions concerning recalling them from injuries. Coach **J** reported:

“The games ahead influence and the away games excite players and make them to come back quickly”.

Similarly, Coach **K** said:

“Players themselves cheat and pretend that they are recovered fully because they are paid according to the played games and they do not want to lose their places in the team line up”.

In addition, coach **H** quoted:

“Injured players themselves, especially if there are an extra money promised and the away games, all influence the injured players restarting activities so quickly”.

5.5 Have you ever felt a need of assistance from somebody else to make a final decision of an injured player to return to training/competition?

For this question, three themes were identified. These included; no need of assistance from someone else to make the decision, the coaching staff and the more experienced coaches provided appropriate assistance and advice on how to allow previously injured players to return. A large number of coaches denied the need of assistance from somebody else to make a final decision on allowing the return of previously injured players. The following statements reflect this:

Coach **J** replied:

“No, because I know my team better than anybody else and I know, when and why I make a decision”.

Coach **I** agreed:

“Not at all but sometimes I obey my team manager’s decision”.

Conversely, several coaches reported the need for assistance from somebody else regarding the decision of permitting the return of previously injured players. Some of them indicated that, they do not know who to consult for that kind of assistance. This is substantiated by the following: Coach **K** stated:

“I do especially if a player is having repeated same injuries and /or if the injury takes long to heal but I wonder who is the right person to talk to in such situation”.

Other coaches indicated that they consulted their coach assistant, coaching staff, nurse, team manager, physiotherapist and mostly their fellow more experienced coaches.

Coach **D** said:

“Yes and I consult my team manager to make a final decision and/or I consult my fellow experienced coaches for advices”.

Similarly, coach **E** quoted:

“It happens and quite often I consult my coach assistant to make a final decision”.

5.6 What kind of assistance do you provide to injured players during the rehabilitation process?

The kind of assistance provided by coaches to injured players during rehabilitation process was categorised and presented under the following themes: medicines and medical care accessibility to treatment, rest, moral and psychological support, financial and follow up process. It is evident from the interviews that the follow up process of injured players during rehabilitation process indicated by coaches concerned only the liaison between injured players and the team managing committees as illustrated in the following quotes.

Coach **G** said:

“If a player claims to have suffered from a serious injury then I visit her to see if it is true and after that I ask the team managing committee to intervene...”

Coach **E** offered a similar comment:

“I submit and connect the players to the team managing committee and I make sure that the player received medicines and/or went to hospital If necessary...”

The majority of coaches therefore were of the opinion that the team managing committees dealt with all players queries. The findings from interviews revealed that the financial interventions targeted only the medicines and medical care expenses and hardly focused on other areas as quoted by coach **A** that:

“... social assistance is provided depending on the financial availabilities...”

Coach **B** said:

“ ... the team pays medical care for players...”.

Similarly coach **L** quoted: *“ ... I report to the team management committee which pays for medical expenses fully...”*

Rest is an important component to be considered in rehabilitating sport injuries. However, the findings of this study based on the interviews conducted with coaches, clearly showed that coaches paid less attention to the importance of a rest period in the rehabilitation process of injured players in their teams. It is clear that players did not equally benefit from the positive effects of rest during rehabilitation and recovery from injury. It seemed that key players were more

penalised compared with the rest of players in the team as demonstrated in the following:

Coach **A** said:

“...I grant rest if required depending on my appreciation...”

Similarly, coach **B** stated:

“...all depends on the player’s availability and ability and the competition pressure, if the pressure is too much we do not wait”.

Psychological and moral support in the sport injury rehabilitation process also plays a vital role in the recovery outcomes of injured players. It allows the injured player to not feel isolated from the team. This boosts the injured player’s self-esteem and enhances acceptance and coping with the treatment offered, which in turn speed up recovery. (Podlog & Eklund, 2007). The majority of the coaches in this study reported to have provided the psychological and moral support to their injured players through visits, calls and advice. Unfortunately these benefits were notequally offered to all injured players as illustrated in the quotes below:

Coach **C** said:

“I do the follow up and give advices especially to the key players...”

Coach **A** stated:

“...I provide psychological support, I visit, give advices and talk if judged necessary...”.

5.7 How do you assist an injured player to return to sporting activities and to cope?

A player returning from previous injury loses her pre injury fitness level and performance. The gravity of the loss depends on the duration length she spent out of the pitch for rehabilitation. The injury affects not only the physical body but also the psychological state of the injured player. The pressure of achieving the pre injury fitness levels and performance together with the fear of re-injury are some of the troubles governing the mind of a returning player. It is therefore important that these players are offered guidance and assistance on their return to activities. Teaching them to cope would be crucial and the coaches would be deemed to be the right person to implement the programmes (Bianco & Eklund, 2001).

The findings of this study based on coaches interviews revealed a total absence of a planned programme to guide returning injured players from their previous injuries. None of the coach teaches returning players how to behave in order to achieve a safe return and complete cope to sporting activities. The majority of the coaches admitted to have no opposition if the player deems herself fit to resume the sporting activities but the insistence on exercise was mainly imposed by the coaches.

Like in the case where coach **A** reported:

“If a returning player qualifies herself fit enough to play, I do not oppose and sometimes I insist she should exercise/play more to regain the fitness if

she does not want to lose her place in the team”.

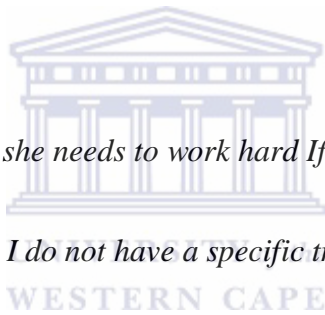
Similarly, coach C said:

“It depends on returning players themselves, if they say they are ready to exercise with others and/or play the game, I let them do”.

However, the majority of the coaches did not have a specific training programme for the returning players to assist them in re-integrating and coping. This forced the majority of the returning players to go for personal guided extra training sessions to catch up with other players’ level of fitness.

Coach G said:

“I remind her that she needs to work hard If she does not want to lose her place in the team , I do not have a specific training programme for the returning players”.



Coach F stated:

“I ask a returning player from injury to try hard and convince me that she did not lose her fitness, otherwise she has to make an extra effort to catch up herself”.

However, two of the coaches had initiated a specific gradual training programmes for returning players but unfortunately, the time allocated to a returning player to regain her level of fitness is far lower than what is required. The following excerpts illustrate this:

Coach **L** said:

“I give 2 days of running and playing the ball alone outside the pitch and thereafter she trains with the rest of the team”.

Coach **I** similarly mentioned:

“I give 2 days to catch up and then they have to make an extra effort to cope with others”.

In addition, coach **B** said:

“In collaboration with the team nurse, we plan for a special and specific gradual exercise programme for injured players returning to activities until she copes depending on the player’s availability, ability and the competition pressure, if the pressure is too much, we do not wait”.

These interviews clearly indicate that coaches in Rwandan soccer provide less moral and psychological assistance to their injured players during the rehabilitation process. It was also found that coaches performed their roles poorly concerning allowing the return of previously injured players. This was found to be contrary to what is recommended in the literature. This would predispose players to injury recurrence and could affect the players’ performance due to the prolonged time they spent with persistent injuries.

CHAPTER SIX: DISCUSSION

6.1 Introduction

This chapter aims to critically review the results of this study in relation to literature available. It discusses the prevalence, mechanism, location and severity of injuries and the influence different factors have on soccer injury occurrence. The perceptions of injured players and their coaches' perspectives on returning players to activities are also discussed. The limitations of the study are clarified at the end of this chapter.

6.2 Injury prevalence

Participation in sports helps to promote a physically active lifestyle but, despite the documented health benefits of increased physical activity, the sports participants are at risk for sports-related injuries. Several studies classify soccer among the three first leading sports with high rate of injuries (CDC, 2006). Particularly in soccer, the rate of injuries was reported to be higher in female than male soccer players due to physiological and anatomical differences between them (Bennett & Fawcett, 2006).

The current study highlighted that a high percentage of soccer players in Rwanda sustained injuries while participating in soccer. Almost half (45%) of all the female soccer players in Rwanda sustained injuries during the last three seasons. This prevalence rate is seemingly high, it is much lower when compared to studies conducted by Faude et al. (2005) and Azubuike and Okojie (2009) who reported a prevalence rate of 70% and 81% respectively.

Comparison of the current study with that of Faude et al. (2005) and Azubuike and Okojie (2009) above should be with caution as several factors could be related to the discrepancies. Firstly, female soccer in Rwanda is just starting and it is amateur while the above studies were conducted on professionals. Secondly, the information regarding the sustained injuries was provided by professional medical practitioners compared to self-report in the current study. Finally, the considered definition of injury differs from studies and the sample sizes varied from 143 and 196 in the aforementioned studies to 300 participants in the current studies. These and others should be considered before generalising these results.

This difference would be explain that female soccer in Rwanda is in its early stages with limited participation and exposure time compared to the more professional teams where competition levels are higher. Furthermore, this study clearly highlights that injuries among female soccer players could be seen as a cause of concern by reinforcing preventive measures to minimise its rate and increase safety.

6.3 Location and mechanism of injuries

Soccer injuries affect any part of the body. A number of studies showed the lower extremities to be the most common site for injury in female soccer players but the trunk, upper extremities are also sites of injuries (Giza et al., 2005). Tegnander et al. (2008) highlighted the high prevalence of injuries in the lower extremities (81%) as opposed to the upper extremities and head combined (6.3%) among female soccer players. This concurs with the results of the current study where 69.6% of the overall injuries were to the lower extremities with ankle (23.7%), knee (14.8%) and thigh (14.1%) the commonest affected parts and 6.7% of the

injuries attributed to the head, 8.2% the back and 4.4% to neck and shoulders respectively. Similarly, these results are similar to the results reported by Faude et al. (2005) that lower extremities hosted the majority of the overall injuries (80%) with the ankle (43), knee (45) and thigh (44) being the commonest sites of injuries.

Soccer being played with the ball expelled strictly using the feet to all players with particularities to goalkeepers, it should be strong enough to explain the reason why the injury occurrence predominate on the lower extremities than any other body parts. Furthermore, the collision, sprinting, decelerating, pivoting, jumping, landing and heading manoeuvres commonly associated with soccer practice also would explain the easy involvement of the other body parts than lower extremities alone.

Sixteen soccer related playing activities have been identified as possible mechanisms for injuries (Rahnama et al., 2002). These activities include amongst other, making a tackle, passing the ball, set kick and receiving a tackle. Furthermore, contact to contact between players was found to occupy the forefront injury mechanism but non-contact injuries also were observed (DeLee et al., 2009). In this study, the findings revealed contact to contact between players to be the leading mechanism of injuries with collision (23.7%), tackled (20.7%) and tackling (17%) amongst it. These results are supported by the findings reported by Yard et al. (2008) who also found that majority of injuries in soccer occurred resulting from collision between player of the opponent or teammates, being tackled or tackling. The running (8.2%), shooting (8.2%) and heading (7.4%) predominated the non-contact injury mechanism in this study. These

findings do not oppose the results found in previous studies that non-contact injuries resulted mainly from poor landing, sudden cutting, kicking the ball, sprinting, deceleration, changing pace and direction (Alenton-Geli et al., 2009).

It is therefore not surprising if you consider the characteristics of soccer being rough contact sport and manoeuvres performed to practice soccer including jumping, kicking the ball, tackling, sprinting and control of the ball against defending pressure of the adverse team (Landry et al., 2006). It should obviously explain why the contact to contact with tackling and being tackled control the forefront of the leading mechanisms.

6.4 Risk factors associated with injuries

Several studies investigated the risk factors associated with soccer injury. A number of intrinsic and extrinsic risk factors were identified as associated with injury occurrence in this study. The selected intrinsic risk factors under investigation in this study included age, weight, height, BMI, joint laxity, recurrence of previous injuries and premenstrual symptoms. Furthermore, the extrinsic risk factors including level of competition, joint support, use of protective equipment, call in national team, preventive techniques and player's position in the squad.

6.4.1 Intrinsic risk factors

Age has been found to be associated with soccer injuries in several studies (Chomiak et al., 2000). In this study, age was found to be strongly associated with injury occurrence with most (27%) of injuries found in female soccer players aged between 18-21 years old. These findings differ from that found by Ostenberg and

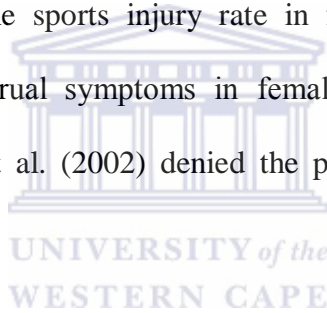
Roos (2000) that female players older than 25 years were prone to suffer from more injuries compared with those younger than 25 years. The Rwandan culture considers sports as an activity for young girls and therefore explains the limited number of older participants. It is therefore not surprising for the young players to be more prone to injury. In addition, 18-25 age range is believed to be a soccer age where players strive to achieve the highest level and be known. In addition, it is at this age range where players are exposed to participate in different international competitions including the U 17, U 19, U 20, U 21 and Olympic games (U 23) which enhance the exposure time and participation therefore the more likely high rate of injury to be observed (Bell et al., 2000).

A number of researchers have suggested that hormonal fluctuations associated with the menstrual cycle may be one explanation for the increased risk for females to sustain soccer injuries. Moreover, the premenstrual symptoms are some of the manifestations relating to numerous changes associated with hormonal variation within their bodies. Irritability, irascibility, swelling and discomfort in the breasts, swelling and congestion in the abdomen are some of the premenstrual symptoms commonly met which affect and disturb the player's coordination thus enhancing the risk of injury occurrence (Möller-Nielsen & Hammar, 1989). It is evident therefore that due to manoeuvres and velocity the practice of soccer imposes on the players, it would be easy for the disturbed coordinated mind to concede a huge number of injuries.

This study reported a strong association between injury occurrence and premenstrual symptoms where 25% of the injured players reported to experience premenstrual symptoms at time of injury. These findings concur with the results

found by Möller-Nielsen and Hammar (1989) that the female soccer players with the premenstrual symptoms were more susceptible to injuries compared to the players without premenstrual symptoms.

Oral contraceptive pills (OCP) use was believed to minimize sports injury rate by controlling the premenstrual symptoms which may predispose players to injuries. In this study, the use of OCP was found to strongly be associated with injury occurrence where majority of the OCP users (71.9%) reported to have not suffered from any soccer related injury in three years last seasons. These findings are supported by Gherard et al. (2009) who are of the opinion that OCP use considerably lowered the sports injury rate in female athletes by controlling effects of the premenstrual symptoms in female's body. On the other hand therefore, Slauterbeck et al. (2002) denied the positive effects of OCP use on lowering sport injuries.



Studies reported that injury, not only affects the static and dynamic stabilizers but also the proprioception of the injured structure which increases the likelihood of the recurrence of injuries (Murphy et al., 2003). It was found in this study that 52.6% of the injuries were recurring from previous injuries. The relationship between the injury reoccurrence from the previous injuries was also found strong. The findings are supported by Hawkins and Fuller (1999) who reported soccer injury recurrence rate of overall injuries to be high. Similarly, Surve et al. (1994) found a high incidence of ankle sprain recurrence in unbraced soccer players with previous history of ankle sprains compared with those wearing ankle brace.

However, several factors had been proved to be associated with soccer injury recurrence. McKay et al. (2001) found that previous injuries followed with inadequate rehabilitation were likely to re-occur at the same location. Furthermore, Chomiak et al. (2000) reported that improperly rehabilitated previous injuries accompanied with early return to sporting activities predispose players from minor to major injury of the same type and location. Alarming in this study, it was found that no team had either a team medical doctor or physiotherapist. Only one team had a permanent nurse and the other one team had a visiting physiotherapist who accompanied the team only on match days. The present study clearly highlights the lack of a medical team which would explain the possible poor rehabilitation and possible early return to sporting activities leading to a high injury recurrence rate in Rwandan female soccer players.

The influence the joint laxity has on isolated single injury is not clear but it has been shown to be a risk factor for all injuries considered as a group among female soccer players. It was found to be strongly associated with injury occurrence in this study where, 68.1% of the injured players presented joint laxity of the elbow, knee or ankle respectively. These findings are supported by Ostenberg and Roos (2000) that the generalized joint laxity increased five times risk of incurring injuries in female soccer players. Sodermark et al. (2001) also supported the opinion that female soccer players with generalized joint laxity are more prone to injuries compared with the lower joint laxity counterparts.

6.4.2 Extrinsic risk factors

Level of competition has been shown to be a risk factor of injuries in soccer. More injuries were believed to occur during the competition than training sessions. It was found in this study that 53.3% of the injuries were sustained during matches. The relationship between the level of competition and injury occurrence in this study was found to be strongly significant. The similar findings were reported by Murphy et al. (2003) who were of the opinion that matches predispose soccer players to injuries than trainings. Furthermore, Nielsen and Yde (1983) also supported the opinion that more injuries are observed in game than practice session in soccer.

The level of intensity during training and competition varies due to the target and objectives to be achieved. It could most probably explain why players are more exposed to injuries during the competitive matches where points, trophies, permanent place in squads and national team selection are pressing factors compared to practices where only new techniques need to be learned and practised. This fighting spirit to win trophies/competitions governs also the Rwandan female soccer which could explain the difference of injury rate between the practices and games.

Being selected for the national team increases the exposure time and the competitive level which could predispose players to injury. In this study, 84% of the players selected for the national team suffered from soccer related injuries. It is not surprising considering the extra-exposure and the high level the national team is competing at as concluded by Nielsen and Yde (1983) that the injury incidence, the pattern of injury and traumatology vary between the players

participating at different level of soccer competition. The level of significance was found strong between being called in national team and the soccer related injury occurrence. It is clear that players who are selected for the national team are the best even in their clubs respectively. This would explain the extreme exposure and the possible fatigue if you consider the number of games they participate in. The fact that Rwandan female national team is participating in various regional and continental competitions would explain the increased vulnerability of called players to sustain injuries.

The use of joint support devices has been proved to be effective in lowering injury rate especially in soccer players with history of previous injuries. Unfortunately in this study, only 28% of the participants supported their joints during soccer plays. The majority of them used only elastic bandages to support unhealed body parts when asked to resume sporting activities. The association between joint support and soccer injury occurrence was found strong and a big number (77.4%) of players who reported to always support their joints never suffered from any soccer related injury in this study.

The use of joint support should be emphasised more in Rwandan female soccer due to its effective ability to reduce the incidence of injuries especially in female soccer players with previous injury history as recommended by Sharpe, Knapik and Jones (1997).

Other protective equipments use also plays an important role in soccer injury prevention. The use of shin guards particularly was reported to considerably lower the incidence of soccer injuries of the lower legs. It was found in this study that

81% of the players who did not wear shin guards for protection, sustained injuries. It does not differ from what was found by Ekstrand and Gillquist (1983) that a high frequency of traumatic leg injuries is commonly observed among soccer players with inadequate or no shin guards at all. The relationship between the injury and shin guards use was reported to be strongly associated in this study.

Warm up, stretching and cool down is believed to be effective in the prevention of soccer injury if routinely performed. Of the injured players in this study, 50.7% did not include cool down in their training schedule which was found to be associated with injury occurrence. In addition, 59.8% of female players who do not include skills training in their respective coaching schedule suffered from injuries. The aforementioned findings concur with the results of other studies that pre-match/practice performance of warm up, stretching, cool down together with proper training program considerably minimize the rate of injuries (Ekstrand et al., 1983). These findings highlight the concerning trend in the training schedules of Rwandan female soccer. It is evident therefore that coaches who are responsible for planning and organizing the trainings, should include warm up, cool down and skills training as part of their regime. Implementation of a routinely set techniques of warm up, stretching, strengthening, cool down, plyometric and skills training including drills, set play, ball handling and kicking skills would most probably help minimizing the incidence of injuries recorded among Rwandan female soccer players as recommended by Twomey, Finch, Roediger and Lloyd (2009).

6.5 Social support and assistance perceived by injured players during rehabilitation process

It was reported in several studies that social support and assistance provided by coaches during rehabilitation process help injured players to easily adhere to treatment resulting to quick and complete recovery. The most effective assistance and support was revealed to be the one meeting the injured players needs and it covering different areas (Bianco & Eklund, 2001). Coach listening to his/her players improves coach-player relationship. Listening without being judgemental and coach showing comfort and care scored the highest mean score in this study. It is supported by Podlog and Eklund (2007) that listening to the players concerns maintains positive coach-player relationship needed to help returning players rebuild confidence to overcome returning to sport difficulties and re-injury.

Despite the high score in the current study, it seems that female soccer players in Rwanda did not benefit much from it if you consider the excessive pressure exerted on injured players by their coach to faster resume the sporting activities if they do not want to lose their spot in the squads. This clearly indicates the weakness and the failure of coaches in significantly playing their positive role towards the recovery of athletes with injuries in the current study. It would be beneficial if this could be improved because it would decrease the negative thoughts and experience predisposing more returning players to re-injuries (Williams & Andersen, 1998).

The pre-injury acknowledgement and appreciation of injured player's work is needed to keep positive attitudes towards the treatment and recovery of the sustained injury. Coaches' acknowledgement and showing appreciation of the

work and effort of injured players during the rehabilitation process scored 11.6 and 10.1 out of 15 respectively in this study.

Contradicted by the results of the current study from coaches interviews, where injured, especially key players were forced to return prematurely if they do not want to lose their spot in the squads, it is evident that injured players do not receive challenges helping them to evaluate their attitudes and values and their work, efforts before injury were not acknowledged and appreciated. These negatively affect the entire life of returning injured players which result in individual increased pressure justifying probably the early return and so increasing re-injury rate.

Continuous involvement in team sport activities is essential to keep injured players closer with the rest of the team members. Coaches' challenges to motivate the thinking and increasing activity involvement and coaches providing financial assistance, products and gifts received minimal mean scores in this study, 9.8 and 7.7 out of 15 respectively.

It is also unfortunate that these points were not focused on by coaches of the Rwandan female soccer teams. It is rather believed to positively contribute on safe return to sport by eliminating alienation and isolation from the rest of the team and allowing a quick re-integration by continuously updating the injured players with the team new tactics and plays (Podlog & Eklund, 2007).

6.6 Coaches perspectives and roles in decision making and returning injured players from injury

Several studies highlighted the role of coaches in returning injured players from previous injury and cope but emphasised that the final decision should always be taken by rehabilitation specialists (physiotherapists and/or qualified medical doctor) (Podlog & Eklund, 2007). The findings of this study indicate that 65.3% of the injured players reported that the final decision for them to resume team sporting activities was made by their coaches.

The results differ from those found by Podlog and Eklund (2007) that the final decision for injured player to resume sporting activities might be taken by physiotherapist and/or medical doctor specialized in sport medicine and that the medical clearance from them have to be presented. Furthermore, key players, the level of competition and the game ahead were found to be the most influential factors for coaches to make the final decision of returning players from injury. It is supported by the results found by Vergeer and Hagg (1999) that players' status (starters vs substitutes and bench) and the ahead games (close game vs clear win/loss game) to be the major factors influencing coaches to return injured players from injury.

Contrary to what suggested by Podlog and Eklund (2007) that coaches hold the key of a good rehabilitation and players reintegration from their previous injuries, the findings of this study clearly demonstrate the carelessness of coaches towards injured players. It is unfortunate therefore that coaches of the Rwandan female soccer teams do not perfectly play their role rendering to collapses of the rehabilitation and reintegration process and so predisposing players to reinjure.

Studies indicated that a returning player was not only affected physically but also psychologically. It is in this regards that Bianco and Eklund (2001) suggested coaches to be the right persons to guide and assist returning players getting fully reintegrated and safely cope with sport activities demands. Conversely to what found in this study where coaches' mainly provided assistance was the connection between the injured players and the team managing committees. No coach reported to have a planned gradual reintegration program for returning players which rather was found to be more beneficial and highly required for a safe return and cope of injured players from their previous injuries (Podlog & Eklund, 2007).

It is alarming that Rwandan female soccer team coaches, who rather stand for the entire rehabilitation team, considering the total absence of rehabilitation specialists in all teams, seem to neglect their injured players. Their role in rehabilitation process found to be limited only on connecting injured players with the team managing committees and technically, the lack of planned gradual program to reintegrate returning players from injuries witnesses their carelessness. This too serious issue should then be considered in the future to increase the safety in Rwandan female soccer. Individual training sessions, keeping injured athletes involved in sport team activities and providing social support were suggested to be effective in safe and adequate reintegration and cope for returning players from previous injuries (Podlog & Eklund, 2007).

CHAPTER SEVEN:

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

In this chapter, a summary of the main findings is provided and a concise conclusion is drawn. To counter the factors associated with sports injuries among first division female soccer players and some suggested recommendations are made at the end of this chapter.

7.2 Summary

Females, as male soccer players are exposed to soccer related-injuries. Little or no studies had been conducted to investigate injuries in Rwandan female soccer players. The aim of this study was to establish the factors associated with sports injuries in first division Rwandan female soccer players. To achieve this aim, players and their coaches in the female Rwanda first division were approached and the information they provided was carefully analyzed using inferential statistics methods. A self-administered questionnaire was used to collect quantitative data from players and structured one to one interview helped to collect qualitative data from the team coaches.

The findings from this study highlighted a strong relationship between injuries and some intrinsic and extrinsic risk factors. Joint laxity was found in 68.1% of the injured players, 52.6% of the total injuries were recurrent and 55.6% of the injured players presented with premenstrual symptoms. Playing for national team

and improper use of protective equipment were also found to be strongly associated with injury occurrence.

The current study further revealed that no female soccer team in Rwanda had either a physiotherapist or medical doctor for the players' care. Consequently, many players consult traditional healers (28.2%) or undergo self treatment (19.2%) regardless the severity of injury where most of them were severe (85.9%). The decision to restart sporting activities was mainly taken by coaches (65.2%).

The lower extremities counted majority of the injuries (69.6%) with ankle being the more affected body part (23.7%). Tackle actions were the leading injury mechanism (37.7%) and strikers were more injured than other players (38.4%).

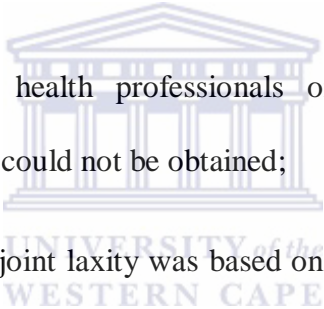
The social support and assistance provided by the coaches towards the players during the rehabilitation process were found inadequate and inappropriate. None of the coaches had a planned training and re-integration program to help returning players from previous injuries to cope.

7.3 Conclusion

Generally, Rwandan female soccer still has a long way to go in the area of injury prevention. Example of shortcomings in area of implemented injury preventive measures were the improperly use of protective equipment and the lack of shin guards and shoes during training sessions. Furthermore, the same pair of shoes was used for more than two years regardless of the weather and playing surface. The total absence of rehabilitation specialists in all teams and the big percentage of injured players that either treated themselves or used traditional treatment

highlighted the poor and inadequate rehabilitation they receive. The lack of attention paid to the implementation of proper injury prevention protocols to minimize the injury occurrence in Rwandan female soccer is a cause of concern. Insufficient social support and assistance provided by coaches during rehabilitation process may increase the negative thoughts and individual pressure of the injured players predisposing them to reinjure. The lack of well planned gradual programs to safely return and reintegrate injured players from their previous injuries was also highlighted in this study as a big challenge towards the safety of female soccer in Rwanda.

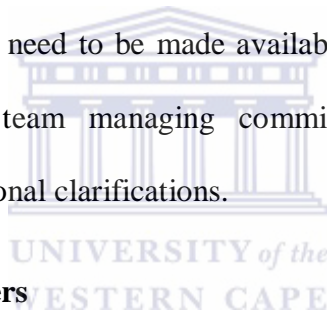
7.4 Limitations

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- Due to lack of health professionals on team, detailed information regarding injuries could not be obtained;
 - Determination of joint laxity was based on goniometry measurements and few joints only were measured. Many joints and level of different female hormones in the blood should also be measured in the future to find the influence they have on injury occurrence with further precisions;
 - The quantitative data was collected using a self-administered questionnaire and was therefore based on self-reports. Self-report measures are open to bias and misreporting, particularly when the time and type of sustained injury were not remembered or simply not be in mood of answering that questions. This should be considered in the future studies;

- Cross-sectional method was used in this study. It collects the data at one point in time and does not provide time to follow up predisposed players. Prospective study should be considered and used in the future;
- Direct and parallel comparison of the results of this study with those conducted in other countries should be done with caution due to environmental, sample and methodological variations between different studies. The only results of studies conducted in almost the similar conditions with this study should be compared.

7.5 Recommendations

The results of this study need to be made available to all female soccer players, team coaching staffs, team managing committees and federation through workshops to give additional clarifications.



7.5.1 To team managers

- ✚ Sufficient protective equipments need to be provided to all players for both training and match sessions;
- ✚ Coaching staff made up of technical, tactical and fitness coaches together with a permanent qualified medical practitioners should at least be available for players' care;
- ✚ Coaching staff members should attend technical workshops and training to update their knowledge.

7.5.2 To coaches

- ✚ To leave the responsibility of taking the final decision on returning a player from injury to the team medical practitioner or other health professional;
- ✚ To plan a specific gradual training program for returning players from previous injuries which will allow easy re-integration and minimize recurrent injury rate;
- ✚ To adequately and fully fulfil their tasks during rehabilitation process which will help injured players to adhere to treatment and so speeding up the healing with positive outcomes;
- ✚ To reinforce the injury preventive techniques in their coaching schedules.

7.5.3 To Fédération Internationale de Football Association (FIFA)

- ✚ To revise the play rule and include all tackle related gestures in soccer playing faults.

7.5.4 To Fédération Rwandese de football association (FERWAF)

- ✚ To install the rule obligating each team in the first division to have a qualified medical practitioner on its coaching staff;
- ✚ To continuously organize technical seminars and workshops involving the team coaching staff, managers and owners of the teams just to have a common understanding and updating their knowledge;
- ✚ To advocate for the creation of academy schools for motivated, talented and passionate soccer young females.

7.5.5 To Ministry of Sports and Culture (MINESPOC)

- ✚ To provide sufficient infrastructures according to the required standards.

7.5.6 To players

- ✚ To encourage them to consult qualified medical practitioners in sport medicine and obey their recommendations;
- ✚ To always use protective equipment and other preventive measures in both trainings as well as in matches to minimize the rate of injury occurrence.



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10 august, 2010

APPENDIX A

To,

The President of Rwandese Football Federation (FERWAFa)

P.O. Box 2000

Kigali- Rwanda.

Excellence,

Re: Permission to conduct a research study

I am a Rwandan, postgraduate student enrolled in Physiotherapy, masters program at University of western Cape- South Africa. I am expected to conduct a research as part of requirement for a Masters degree in Physiotherapy. The title of my study is “ **Factors associated with injuries among the first division female soccer players in Rwanda**”

Please find the attached letter of acceptance of my research proposal by the authorities of the University of Western Cape.

I hereby request the permission to carry out the above-mentioned research on all first division female soccer teams in Rwanda.

It is hoped that the results of this study will provide information needed regarding factors associated with soccer injuries and its prevention to enhance safety in female soccer.

I would be very grateful if you would allow me carrying out this study during October-November, 2010. Participation will be anonymous and voluntary and the information gathered will be treated with respect and confidentiality.

Hoping for your positive response.

Sincerely,

Jean Damascene NIYONSENGA

Supervisor: Prof. Julie PHILLIPS

10 august, 2010

APPENDIX B

To,

His Excellence the Minister of Youth, Culture and Sports

Kigali- Rwanda.

Excellence,

Re: Permission to conduct a research study

I am a Rwandan, postgraduate student enrolled in Physiotherapy, masters program at University of western Cape- South Africa. I am expected to conduct a research as part of requirement for a Masters degree in Physiotherapy. The title of my study is “ **Factors associated with injuries among the first division female soccer players in Rwanda**”

Please find the attached letter of acceptance of my research proposal by the authorities of the University of Western Cape.

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Hoping for your positive response.

Sincerely,

Jean Damascene NIYONSENGA

Supervisor: Prof. Julie PHILLIPS



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592524, Fax: 27 21-9591217

E-mail: mwarner@uwc.ac.za

CONSENT FORM

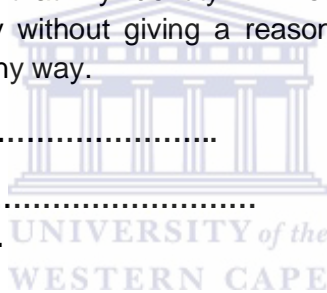
Title of Research Project: Factors associated with sports injuries among first division female soccer players in Rwanda.

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name.....

Participant's signature.....

Date.....



Witness' name.....

Witness' signature.....

Date.....

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Prof. Julie PHILLIPS

University of the Western Cape

Private Bag X17, Belville 7535

Cell: (021) 959 2542

Fax: (021) 959 1217

Email: jphillips@uwc.ac.za



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FORMULAIRE D'APPROBATION

Titre du Projet de Recherche : Facteurs associés avec les lésions sportives parmi les femmes footballeuses en première division au Rwanda.

L'étude m'a été décrite dans la langue que je comprend, j'accepte librement et volontairement de participer. Mes questions sur l'étude ont été répondues. J'ai compris que mon identité ne sera pas dévoilée et que je peux retirer ma participation à l'étude n'importe quand sans donner des raisons, et ceci n'aura aucun effet négatif sur moi en tout cas.

Noms du participant.....

Signature du participant..... **Date**.....



Noms du témoin.....

Signature du témoin..... **Date**.....

Si tu aurais quelques questions concernant cette étude ou souhaiterais mentionner quelques problèmes rencontrés concernant cette étude, tu es prié de contacter:

Coordinatrice d'étude : Prof Julie Phillips

Université du Western Cape

Private Bag X17, Belville 7535

Mobile: (021) 959 2542

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Email: jphillips@uwc.ac.za



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KWEMERA KUGIRA URUHARE

Ubushakashatsi: Ibijyanye n' impamvu ziyanye n'imvune zo mu mikino kubagore bakina umupira w'amaguru mu cyiciro cya mbere mu Rwanda.

Ubu bushakashatsi narabusobanuriwe mu rurimi numva neza kandi niyemeje nta gahato kubugiramo uruhare. Ibibazo byose nabugizeho nabiboneye ibisubizo kandi nasobanukiwe neza ko amakuru nzatanga azakomeza kuba ibanga kandi ko mfite uburenganzira bwo kubivamo nta bisobanuro bindi, igihe icyo ari cyo cyose nakumva ntakifuza kuba muri ubu bushakashatsi ntibigire ingaruka bingiraho.

Amazina y'ugira uruhare mu bushakashatsi.....

Umukono/Igikumwe cy'ugira uruhare mu bushakashatsi.....

Italiki.....

UNIVERSITY of the
WESTERN CAPE

Amazina y'umutangabuhamya.....

Umukono/Igikumwe cy'umutangabuhamya.....

Italiki.....

Ugize ikibazo kirebana n'ubu bushakashatsi cyangwa ushatse kumenyekanisha ibibazo wagize birebana n'ubu bushakashatsi, wabimenyeshya:

Umuhuzabikorwa w'ubushakashatsi: Professor Julie PHILLIPS

Kaminuza ya Western Cape, Private Bag X17, Belville 7535

Tell: (021) 959 2542 / Fax: (021) 959 1217

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INFORMATION SHEET

Project Title: *Factors associated with sports injuries among first division female soccer players in Rwanda.*

What is this study about?

This is a research project being conducted by Mr. Jean Damascene NIYONSENGA at the University of the Western Cape. We are inviting you to participate in this research project because you practice female soccer in Rwandan first division and may be exposed to soccer related injuries. The purpose of this research project is to establish the factors associated with sports injuries among first division female soccer players in Rwanda.

What will I be asked to do if I agree to participate?

You will be asked to provide a signed consent letter to participate in this study. You will have to answer all questions of the questionnaire. The questionnaire will be issued to you and collected by the researcher at the agreed time. The researcher will approach you at your training camp where the measurements will be taken as well as the questionnaire distribution and collection. You will deserve the right to withdraw from this study at any time and the right to ask for more clarification on the study. In addition, range of motion of elbow extension, knee extension and dorsiflexion together with passive opposition of the thumb and hyperextension of the fingers will be measured by the researcher. The information you provide will be kept confidentially and the feedback will be made available to you after the completion of this study.

Would my participation in this study be kept confidential?

We will do our best to keep your personal information confidential. To help protect your confidentiality, do not indicate your names and/or other identifiable details. Only the codes will be used on the data forms. Through the use of an identification key, the researcher will be able to link your survey to your identity and only the researcher will have access to the identification key.

What are the risks of this research?

There are no predicted risks associated with participating in this research study.

What are the benefits of this research?

This research is not designed to help you personally, but the results will help the female soccer players, team managers, coaches, team medical practitioners, National Olympic committee, National Federation of Football and researchers to learn more about factors associated with soccer injuries, its prevention and rehabilitation which will help to improve safety in female soccer.

Do I have to be in this research and may I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by *Mr. Jean Damascene NIYONSENGA, a registered student in Physiotherapy Department at University of the Western Cape*. If you have any questions about the research study itself, please contact Mr. Jean Damascene NIYONSENGA on telephone number 0788489667, email: nsengadaj@gmail.com or 2968909@uwc.ac.za



Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Head of Department: Prof. Julie Phillips

Dean of the Faculty of Community and Health Sciences: Prof Ratie Mpofu

University of the Western Cape

Private Bag X17

Bellville 7535

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-9592524, Fax: 27 21-9591217

E-mail: mwarner@uwc.ac.za

FORMULAIRE D'INFORMATION

Titre du projet : Facteurs associés avec les lésions sportives parmi les femmes footballeuses en première division au Rwanda.

En quoi consiste cette étude?

Ce projet de recherche est mené par Jean Damascène NIYONSENGA, étudiant à l'Université du Western Cape. Nous vous invitons à participer dans ce projet de recherche car, vous faites parties du football féminin en première division au Rwanda et que vous pourriez être exposées aux diverses lésions sportives liées au football. L'objectif de ce projet de recherche vise à établir les facteurs associés avec les lésions sportives parmi les femmes footballeuses en première division au Rwanda.

Qu'est-ce qui m'est demandé une fois accepté de participer ?

Vous serez demandé à présenter une lettre d'approbation signée montrant que vous acceptez volontiers de participer dans cette recherche. Ensuite, vous serez demandé de répondre toutes les questions du questionnaire qui vous sera livré. Le chercheur vous trouvera sur vos sites d'entraînement ou quelques prises de mesures ainsi que la distribution des questionnaires y seront effectuées. Le droit de vous retirer à n'importe quel moment sans toute fois donner les moindres explications vous sera réservé. De plus, l'amplitude articulaire des mouvements d'extension du coude, genou, la dorsiflexion du cheville ainsi que l'opposition passive du pouce et l'hyper extension des doigts seront mesurés par le chercheur. La confidentialité et le feedback sur toute information que vous donnez vous seront garantis.

Ma participation à cette étude sera-t-elle gardée confidentielle?

Nous ferons tout possible pour garder très soigneusement ton information personnelle comme confidentielle. Pour garantir ta confidentialité, ne mentionne pas votre noms et/ou autres détails qui pourraient aider quiconque à t'identifier. Seulement les codes identifiables par le chercheur seul seront utilisés pour lui permettre de ne pas confondre l'information accueillie des participants.

Quels sont les risques de cette recherche ?

Aucun risque associé n'est connu à la participation de ce projet de recherche.

Quels sont les intérêts de cette recherche?

Cette recherche n'entre pas seulement dans le cadre de vous aider personnellement, mais aussi ses résultats aideront les femmes footballeuses, manager des équipes, entraîneurs, soigneurs, comité national olympique, fédération rwandaise de football et autres chercheurs d'étudier encore plus les facteurs associés avec les lésions de sports, leur prévention et réhabilitation nécessaire pour construire le football féminin sain.

Une fois m'impliqué dans cette recherche puis-je m'arrêter n'importe quand?

Ta participation dans cette recherche est totalement volontaire. Tu peux choisir de ne pas y participer du tout. Si tu décides de participer dans cette recherche, tu auras aussi le droit de te retirer à n'importe quel moment. Si tu décides de ne pas participer dans cette étude ou tu t'arrêtes d'y participer, tu n'en sera pas pénalisé et ne perdras rien de toute sorte d'intérêt.

Que faire en cas de questions?

Comme nous l'avons signalé au début, cette recherche est menée par Jean Damascène NIYONSENGA, étudiant inscrit au Département de Physiothérapie de l'Université du Western Cape. Si tu as des questions à l'étude de recherche en soit, tu es prié de contacter Mr. Jean Damascène NIYONSENGA, Téléphone 0788489667, adresse e-mail: nsengadaj@gmail.com or 2968909@uwc.ac.za

Tu peux aussi avoir des questions concernant cette étude, c'est ton droit en tant que participant dans la recherche, ou même si tu souhaites relever des problèmes relatifs à l'étude, tu peux dans ce cas contacter le Chef de Département : Professeur Julie Phillips, ou

Doyen de la Faculté des Sciences Communautaires et Sanitaires : Professeur Ratie Mpofu

Université du Western Cape

Private Bag X17

Bellville 7535

Cette recherche a été approuvée par le Comité du Sénat de Recherche et Comité Ethique de l'Université du Western Cape.



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Ubushakashatsi: Impamvu zijyanye n’imvune zo mu mikino kubagore bakina umupira w’amaguru mu cyiciro cya mbere mu Rwanda.

Ubu bushakashatsi bugamije iki?

Ubu bushakashatsi burimo gukorwa na Jean Damascene NIYONSENGA, wiga muri Kaminuza ya Western Cape muri Africa y’epfo. Wahamagariwe kugira uruhare muri ubu bushakashatsi kubera ko uri umugore ukina umupira w’amaguru mu Rwanda kandi ukaba ushobora guhura n’imvune zijyanye n’umupira w’amaguru. Ubu bushakashatsi bugamije gushyira ahagaragara impamvu zose zishobora gutuma imvune zibaho mu bagore bakina umupira w’amaguru mu kiciro cya mbere mu Rwanda.

Nzasabwa gukora iki, igihe nemeye kubazwa?

Urasabwa kwerekan urwandiko rusinye rwerekana ko wemeye nta gahato kugira uruhare muri ubu bushakashatsi. Urasabwa kandi gusubibiza ibibazo byose biri kurutonde rw’ibibazo tuguhaye. Urutonde rw’ibibazo rwuzuzwa uzaruhabwa kandi uzarugarurira umushakashatsi ku gihe mwumvikanyeho mwembi. Umushakashatsi azabasanga aho mukorera imyitozo abazaniye kandi aje gufata urutonde rw’ibibazo byuzuzwa anabafatire ibipimo. Uzaba ugifite uburenganzira bwo guhagarika n’ubwo kubaza ibibazo byose birebana n’ubu bushakashatsi. Umushakashatsi azabapima mu kurambura inkokora, ivi no guhina mu bujuna bw’ikirenge. Azapima kandi ukurambuka kw’igikumwe n’ izindi ntoki z’ikiganza. Amakuru yose uzatanga azaba ari ibanga rikomeye kandi ibizava muri ubu bushakashatsi byose uzabimenyeshwa ubu bushakashatsi burangiye.

Ese ibisubizo ndibutange bizagirirwa ibanga ?

Ibisubizo byose utanga bizagirirwa ibanga rikomeye. Kugira ngo bishoboke, ntiwandike amazina yawe cyangwa ikindi cyose cyatuma abandi bantu bakumenya k’urutonde rw’ibibazo wahawe kuzuza. Utugambo tw’ibanga tuzakoresha n’umushakashatsi wenyine kugirango ashobore gutandukanya abatanze amakuru.

Nta ngaruka se nagira mbaye muri ubu bushakashatsi?

Nta ngaruka nimwe izwi ijyanye n'ubu bushakashatsi uzaterwa n'uko wabugizemo uruhare.

Ni izihe nyungu se ziri muri ubu bushakashatsi?

Ubu bushakashatsi ntibwagennye gufasha wowe gusa, ibisubizo by'ubu bushakashatsi bizafasha abagore bose bakina umupira w'amaguru, abakuru b'amakipe, abatoza, abaganga b'amakipe, komite olempike y'igihugu, ishyirahamwe ry'umupira w'amaguru ndetse n'abandi bashakashatsi mu gusobanukirwa neza impamvu zitera imvune mu bagore bakina umupira w'amaguru, uburyo bwo kuzirinda ndetse n'ubuvuzi bukwiye kugirango bateze imbere umupira w'amaguru w'abagore.

Ese nemeye kubazwa muri ubu bushakashatsi nshobora kwivanamo igihe cyose mbishakiye?

Kwemera kujya muri ubu bushakashatsi ni ubushake bwawe busesuye. Ushobora kwemera cyangwa kutemera kubazwa. Wemerewe kwivana muri ubu bushakashatsi igihe cyose nta nkurikizi, ntuzabihanirwa cyangwa ngo utakaze inyungu iyo ariyo yose wakagombye kubona muri ubu bushakashatsi.

Ndamutse se nshatse kugira icyo nasobanura nyuma y'ubu bushakashatsi nakwiyambaza nde?

Ubu bushakashatsi burimo gukorwa na Jean Damascene NIYONSENGA wiga muri Kaminuza ya Western Cape muri Africa y'epfo. Hagize ikibazo wakwifuzaga kubaza kirebana n'ubu bushakashatsi, wakwiyambaza Jean Damascene NIYONSENGAE kuri numero ya telefoni igendanwa 0788489667, e-mail: nsengadaj@gmail.com cyangwa 2968909@uwc.ac.za .

Ugize ikibazo kirebana n'ubu bushakashatsi ni uburenganzira bwawe nk'ubazwa, cyangwa ushatse kumenyekanisha ibibazo wagize birebana n'ubu bushakashatsi, wabimenyesha:

Uhagarariye ishami rya Physiotherapy: Professor Julie Phillips

Umuyobozi wa Faculty of Community and Health Sciences: Professor Ratie Mpofu

Kaminuza ya Western Cape

Private Bag X17

Bellville 7535

Ubu bushakashatsi bwemejwe na Kaminuza ya Western Cape's Senate Research Committee and Ethics Committee.

**OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH
DEVELOPMENT**

Private Bag X17, Bellville 7535
South Africa
Telegraph: UNIBELL
Telephone: +27 21 959-2948/2949
Fax: +27 21 959-3170
Website: www.uwc.ac.za


5 October 2010

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and the ethics of the following research project by:
Mr. JD Niyonsenga (Physiotherapy)

Research Project: Factors associated with sports injuries among first division female soccer players in Rwanda

Registration no: 10/8/18


Peter Syter
Manager: Research Development Office
University of the Western Cape


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WESTERN CAPE

A place of quality, a place to grow, from hope to action through knowledge



FEDERATION RWANDAISE DE FOOTBALL ASSOCIATION

B.P. 2000 Kigali
Tél. : 250 - 518525
Fax : 250 - 518523

Kigali, October 27, 2010
N° 339 / FERWAF / 2010

Mr. Jean Damascene NIYONSENGA
C/O University of Western Cape

RE: your request to conduct a research study

We acknowledge the reception of your letter requesting to carry out a research study entitled "Factors associated with injuries among the first division female soccer players in Rwanda".

We have the pleasure to inform you that your request has been accepted and would like to request all the teams to assist you in this regard.

Looking forward to have a good cooperation, we remain.

Sincerely yours,

PS. Jules KALISA
27/10/2010

KALISA Jules César
General Secretary
Fédération Rwandaise de Football Association

Banques: BK : N° 040-0015639 FRW N° 040-0205313-94 USD
BCR: N° 010-0215101 - 36 (frw) N° 010-0215102-37 (USD)

REPUBLIC OF RWANDA

copy

Kigali, 28/10/2010

N° 1600/22.40



MINISTRY OF SPORTS AND CULTURE

Chairman of Fédération Rwandaise
de Football Association (FERWAFA)
P.O BOX 2000
KIGALI-RWANDA

Re.: Recommendation for a research study

Dear Sir,

I take this opportunity to recommend Mr. Damascène NIYONSENGA, a Rwandan postgraduate student in Physiotherapy in the University of Cape Town to conduct a research study during October and November 2010 in FERWAFA on the subject "Factors associated with injuries among the First Division Female Soccer players in Rwanda hoping that the results will be helpful for the development of the football of Rwanda.
Please accept, Sir, the expression of my highest consideration.

Best regards,

KARABARANGA Jean Pierre
Secrétaire Permanent
MINISPOC



KARABARANGA Jean Pierre
Secretary Permanent in the
Ministry of Sports and Culture

Annex

- Application of Mr. Damascène NIYONSENGA

APPENDIX L

A questionnaire on Factors associated with sports injuries among the first division female soccer players in Rwanda

Questionnaire number.....

Dear player,

Good day.

My name is Jean Damascene NIYONSENGA and I am a Rwandan postgraduate student enrolled in Physiotherapy, Masters Program at University of Western Cape- South Africa. I am expected to conduct a research as part of requirement for a Masters degree in Physiotherapy. The title of my study is ‘ **Factors associated with sports injuries among the first division female soccer players in Rwanda**’ The findings of this study will provide information needed regarding factors associated with soccer injuries and its prevention to enhance safety in female soccer.

I kindly request your participation in this study by completing the questionnaire with your views, according to the statements of the questionnaire. The participation is voluntarily and the information given will be confidential. Do not mention your name and any other disclosing details.

It is hoped that the information you will give in this study will be helpful in effective planning of factors associated with injuries prevention program and enhancing safety in female soccer in Rwanda.

Thank you very much for your co-operation.

Sincerely Yours,

Jean Damascene NIYONSENGA

Tel. **0788489667**

Email: **nsengadaj@gmail.com**

QUESTIONNAIRE FOR PLAYERS.

We are conducting a survey important for future national and international female soccer sport. The aim is to collect data for the female soccer players by evaluating and highlighting the factors associated with injuries in first division Rwandan female soccer players. **Your answers are very important to us.** Please do not indicate your names on the questionnaire and answer all questions by using tick sign(✓) in corresponding box to indicate the chosen answer. We also argue you to note that all answers will be kept confidential and presented anonymously and scientifically. **Thank you for your participation in this study!**

1.0 Demographic data

1.1 Player research

--	--	--	--	--

 number:

1.2 Age.....

1.3 Weight.....Kgs

1.4 Height.....Cm

1.5 When did you start playing soccer?.....

1.6 International age group:

U 15	U 17	U 19	U 21	Senior

1.7 Player position

	Defender	Midfielder	Striker/Attacker	Goalkeeper
In Club				
In National team				

1.8 Player’s position in the squad: Starter Substitute

1.9 Leg dominance: Right Left

1.10 Occupation.....

2.0 Mechanism of injury

2.1 Have you ever suffered any soccer injury in these three last seasons? Yes
No

2.2 In which activity have you contrasted your injury?

Competitive first team game Competitive reserve team game International game
 Small sided game Practice game (11 Vs 11) Practice drill Specific exercise
 Others

2.3 How did you sustain your injury?

Tackling: Tackled: Running: Shooting: Jumping:

Landing: Heading: Turning: Collision: Overuse:

2.4 Time of injury:

	0-15 mins	16-30 mins	31-45 mins	46-60 mins	61-75 mins	76-90 mins	>90 mins
Match							
Training							

2.5 Duration of session (Mins)

2.6 Did the player complete the session? Yes No

If not, when did she stop?.....

2.7 Playing and training surface:

Training surface:

Grass Artificial Track Indoor (Gymn.) All weather Others

Playing surface:

Grass Artificial Track Indoor (Gymn.) All weather Others

2.8 Surface condition: Dry Wet Hard Soft

2.9 Equipment used:

Appropriate shoes: Yes Non

Shin guards: Worn Not worn

Joint support: Yes No

If yes, which joints?.....

2.10 Diagnostic investigation: Yes No

If yes, please give details.....
.....
.....

2.11 Have you ever suffered any head injury in these three last seasons? Yes
No

2.12 Have you ever suffered any injury of the following body parts in these three last seasons?

Back Groin Thigh Knee Leg Ankle Foot Toes

Neck Arm Hand Wrist Fingers

If yes, give detail.....

.....

2.13 Did you receive a treatment for your injury? Yes No

If yes, what kind of treatment?:

Self Traditional Medical (only) Physiotherapy (only) Medical and physiotherapy (combined) Others

2.14 Number of treatment sessions and duration:

Treatment sessions: Duration:

2.15 Is this a recurrence of a previous injury: Yes No

2.16 Date of return to play from a previous injury:

Day Month Year

...../...../.....

2.17 Who decides for injured soccer players to restart the sporting activities?

Herself Coach Team Physiotherapist Team Doctor Fitness trainer
Coaching staff together Others

2.18 Do you include the following in your coaching schedule?

Warm up Stretching Cool down Strengthening Plyometric exercise
Skills training

If yes,

How often: Always Very often Often Sometimes Never

How long: < 5 mins 5-10 mins 11-15 mins 16-20 mins > 20 mins

3.0 Menstrual cycle:

3.1 At what day (which phase) in the menstrual cycle was the injury sustained?

Pre- ovulatory Ovulatory Post ovulatory Menstruation

Give details:

.....

3.2 Do you use oral contraceptive pills? Yes No

If yes, since when?

3.3 Do you experience any premenstrual symptoms? Yes No

If yes, list them:

.....

4.0 Social support and assistance:

4.1.a How satisfied were you with coach listening without being judgemental or giving advice?

Very dissatisfied 1.....2.....3.....4.....5 Very satisfied

4.1.b How difficult would it have been for you to obtain more advice or time to listen without being judgemental for your coach?

Very difficult 1.....2.....3.....4.....5 Very easy

4.1.c How much do you think your coach listening or advice contributed to your overall well-being?

Very unimportant 1.....2.....3.....4.....5 Very important

4.2.a How satisfied were you with coach showing care and/or comfort during your injury recovery process?

Very dissatisfied 1.....2.....3.....4.....5 Very satisfied

4.2.b How difficult would it have been for you to perceive care and/or comfort from your coach during your injury recovery process?

Very difficult 1.....2.....3.....4.....5 Very easy

4.2.c How much care and/or comfort do you think was provided by your coach during your injury recovery process?

Very unimportant 1.....2.....3.....4.....5 Very important

4.3.a How satisfied were you with coach providing challenges to help you evaluate your attitudes, values and feelings during your injury recovery process?

Very dissatisfied 1.....2.....3.....4.....5 Very satisfied

4.3.b How difficult would it have been for you to coach provided challenges to help you evaluate your attitude, values and feelings during your injury recovery process?

Very difficult 1.....2.....3.....4.....5 Very easy

4.3.c How much do you think your coach provided challenges helped you to evaluate your attitudes, values and feelings during your injury recovery process?

Very unimportant 1.....2.....3.....4.....5 Very important

4.4.a How satisfied were you with coach acknowledgement and showing appreciation of your work and effort during your injury recovery process?

Very dissatisfied 1.....2.....3.....4.....5 Very satisfied

4.4.b How difficult would it have been for you to receive acknowledgement and showing appreciation of your work and effort during your injury recovery process from your coach?

Very difficult 1.....2.....3.....4.....5 Very easy

4.4.c How much do you think your coach acknowledged and showed appreciation of your work and efforts during your injury recovery process?

Very unimportant 1.....2.....3.....4.....5 Very important

4.5.a How satisfied were you with your coach challenges to motivate your thinking and increasing activity involvement during your injury recovery process?

Very dissatisfied 1.....2.....3.....4.....5 Very satisfied

4.5.b How difficult would it have been for you to accommodate your coach challenges to motivate your thinking and increasing activity involvement during your injury recovery process?

Very difficult 1.....2.....3.....4.....5 Very easy

4.5.c How much do you think your coach acknowledged your thinking and increasing activity involvement during your injury recovery process?

Very unimportant 1.....2.....3.....4.....5 Very important

4.6.a How satisfied were you with your coach providing financial assistance, products and gifts during your injury recovery process?

Very dissatisfied 1.....2.....3.....4.....5 Very satisfied

4.6.b How difficult would it have been for you to obtain financial assistance, products and gifts during your injury recovery process?

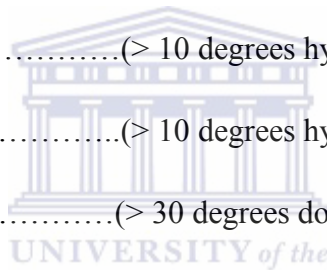
Very difficult 1.....2.....3.....4.....5 Very easy

4.6.c How much financial assistance, products or gifts did you receive from your coach during your injury recovery process?

Very unimportant 1.....2.....3.....4.....5 Very important

MEASUREMENTS FOR JOINT LAXITY (ROM)

- Elbow:.....(> 10 degrees hyperextension)
- Knee:.....(> 10 degrees hyperextension)
- Ankle:.....(> 30 degrees dorsiflexion)



Passive opposition of the thumb to the flexor aspect of the forearm together with passive hyperextension of the fingers so that they lie parallel with the extensor aspect of the forearm tests will also be used to confirm joint laxity (**Carter & Wilkinson, 1964**).

Thanks for your participation in this study.

Un questionnaire sur les Facteurs associés avec les lésions sportives parmi les femmes footballeuses en première division au Rwanda.

Numéro du questionnaire.....

Chère joueuse,

Bonjour,

Je réponds au nom de NIYONSENGA Jean Damascène et je suis un étudiant rwandais à l'Université du Cape Ouest en Afrique du Sud là où je fais ma Maitrise en Physiothérapie. Comme l'exige avant l'obtention d'un diplôme de Maitrise en Physiothérapie, je suis en train de mener une étude de recherche dont le titre est '**Facteurs associés avec les lésions sportives parmi les femmes footballeuses en première division au Rwanda**'. Les résultats de cette étude aideront à fournir les informations nécessaires sur les facteurs associés avec les lésions sportives et leur prévention pour un football féminin sain.

C'est par cette raison que je vous invite à bien vouloir participer dans cette étude en répondant personnellement toutes les questions selon les indications du questionnaire. La participation est bien volontaire et les informations fournies seront confidentiellement gardées. Veuillez à ne pas indiquer votre nom ou autres signes pouvant aider à t'identifier.

Espérons que les informations fournies nous aideront à identifier les facteurs associés avec les lésions sportives et à planifier la prévention adéquate de ces lésions pour le football féminin sain.

Merci pour votre coopération !!

NIYONSENGA Jean Damascène

Tel. 0788489667

Email: nsengadaj@gmail.com

QUESTIONNAIRE POUR LES JOUEUSES

Nous menons une recherche importante pour le futur national et international du football féminin. L'objectif majeur est d'évaluer et identifier les facteurs associés avec les lésions de sports dans des femmes footballeuses rwandaise de la première division. **Toutes vos réponses sont très importantes pour nous.** Veuillez à ne pas indiquer votre nom sur le questionnaire et à répondre toute les questions par le signe (✓) pour montrer la réponse choisie. Nous vous garantissons la confidentialité et l'anonymité de toutes informations fournies et qu'elles seront scientifiquement et respectivement présentées. **Merci de votre participation dans cette recherche.**

1.0 Données démographiques

1.1 Le numéro d'une joueuse dans la recherche

--	--	--	--	--

1.2 Age Ans

1.3 Poids.....Kgs

1.4 Hauteur.....Cm

1.5 Quand est-ce que tu as commencé à jouer au football ?

1.6 Groupe d'âge dans la participation internationale

U 15	U 17	U 19	U 21	Senior

1.7 La position d'une joueuse dans le club :

	Defenseur	Milieu du terrain	Attaquant	Gardien de buts
En Club				
En Equipe Nationale				

1.8 La position d'une joueuse dans la sélection :

Titulaire Remplaçant

1.9 La jambe dominante : Droite Gauche

1.10 L'occupation

1.11 La date de l'accident : Date Mois Année

...../...../.....

1.12 La date de la consultation : Date Mois Année

...../...../.....

1.13 La date de retour aux activités sportives : Date Mois Année
/...../.....

2.0 Mécanisme de la lésion

2.1 Dans quelle activité as-tu contracté cette lésion :

Matches compétitifs de la première équipe Matches compétitifs de l'équipe des réserves Matches internationaux Les petits matches de l'équipe Matches d'entraînement (11 contre 11) Session d'entraînement Exercice spécifique Autres

2.2 Comment as-tu attrapé votre lésion ?

En taclant Etre taclée En courant En tirant En sautant En s'amortissant En jouant par la tête En pivotant collision sursollicitation

2.3 Le temps de la lésion :

	0-15 mins	16-30 mins	31-45 mins	46-60 mins	61-75 mins	76-90 mins	>90 mins
Match							
Entraînement							

2.4 La durée de la session :Mins.

2.5 La joueuse a-t-elle complété la session ? Oui Non

Si non, quand est-ce qu'elle a stoppé la session ?

.....

2.6 La surface pour l'entraînement et match :

Surface pour l'entraînement :

Naturel Artificiel Sable Gymnase Tous les climats Autres

Surface pour les matches :

Naturel Artificiel Sable Gymnase Tous les climats Autres

2.7 Etat de la surface : Sèche Mouillée Dure Douce

2.8 Equipement utilisé :

Chaussures appropriées : Oui Non

Protège tibia : Porté Non porté

Support de l'articulation : Oui Non

si oui, quelles articulations ?.....

2.9 Investigation pour le diagnostic : Oui Non

si oui, donne les détails.....

.....

2.10 Lésion de la tête : Oui Non

Perte de la connaissance : Oui Non

Amnésie pré ou post traumatique : Oui Non

La joueuse référée à l' hôpital : Oui Non

La joueuse a -t- elle passé la nuit à l'hôpital : Oui Non

A-t-elle présenté des symptômes d'un syndrome lié à une lésion de la tête : Oui Non

2.11 As-tu souffert l'une des lésions des parties du corps suivantes :

Lésion du dos hanches cuisse genou jambe cheville pied orteilles
 nuque bras Coude main doigts

Si oui, donne les
détails,.....

UNIVERSITY of the
WESTERN CAPE

.....
.....
.....

2.12 A- t- elle reçu un traitement ?: Oui Non

si oui, quel sorte de traitement :

Soi -même Traditionnel Médical Physio thérapeutique Médical et physio
thérapeutique Autres

2.13 Nombre de traitement et la durée de la session

Sessions de traitement Durée

2.14 cette lésion était-elle une suite d'une lésion précédente ? Oui Non

1.15 La date de retour aux activités sportives de la lésion précédente :

Date Mois Année

...../...../.....

2.16 Qui décide pour une joueuse avec une lésion de reprendre les activités sportives ?

Elle-même Entraîneur Physiothérapeute de l'équipe Médecin de l'équipe
Conditionneur physique de l'équipe Tout le coaching staff ensemble Autres

2.17 Avez-vous les suivant dans vos programme de coaching

Echauffement Etirement Repos Renforcement musculaire (muscultation)
Exercice plyométrique Entraînement d'intelligence

Si oui,

A quelle fréquence : Toujours Très fréquemment Fréquemment Quelques fois
 Jamais

Durée : <5 min 5-10 min 11-15 min 16-20 min >20 min

3.0 Cycle menstruel

3.1 A quelle phase du cycle menstruel as-tu contracté cette lésion

Pré ovulation Ovulation Post ovulation Menstruation
Donnez les détails.....

3.2 Utilises-tu les pilules contraceptifs : Oui Non

Si oui, depuis quand ?.....

3.3 As-tu jamais souffert des symptômes prémenstruel, Oui Non

si oui, énumères-les.....

4.0 Un soutien social et assistance

4.1.a Comment étais-tu satisfaite par écoute et conseils qu'apportait votre entraîneur sans jugement

Moins satisfait 1.....2.....3.....4.....5Très satisfait

4.1.b Combien as-tu trouvé difficile d'être écouter et conseiller sans préjuger par votre entraîneur

Très difficile 1.....2.....3.....4.....5Très facile

4.1.c Comment as-tu qualifié le rôle de l'écoute et les conseils de votre entraîneur dans le processus de guérison de votre lésion

Moins important 1.....2.....3.....4.....5Très important

4.2.a Comment étais-tu satisfaite par les soins et/ou confort qu'apportait votre entraîneur dans le processus de guérison

Moins satisfait 1.....2.....3.....4.....5 Très satisfait

4.2.b Combien difficile as-tu qualifié la réception des soins et/ou confort par votre entraîneur dans le processus de guérison de votre lésion

Très difficile 1.....2.....3.....4.....5 Très facile

4.2.c Combien important as-tu jugé les soins et/ou confort que tu as reçu de votre entraîneur pendant le processus de guérison de votre lésion

Moins important 1.....2.....3.....4.....5 Très important

4.3.a Quelle satisfaction as-tu approuvé avec les challenges par votre entraîneur de t'aider évaluer tes attitudes, valeurs et sentiment pendant le processus de guérison de votre lésion

Moins satisfait 1.....2.....3.....4.....5 Très satisfait

4.3.b Combien difficile as-tu qualifié les challenges de votre entraîneur de t'aider évaluer votre attitudes, valeurs et sentiments pendant la guérison de votre lésion

Très difficile 1.....2.....3.....4.....5 Très facile

4.3.c Combien important les challenges de votre entraîneur vous ont aidé à évaluer votre attitudes, valeurs et sentiment pendant la guérison de votre lésion

Moins important 1.....2.....3.....4.....5 Très important

4.4.a comment étais-tu satisfait avec la reconnaissance et l'appréciation de votre travaux et efforts par votre entraîneur pendant votre période de guérison

Moins satisfait 1.....2.....3.....4.....5 Très satisfait

4.4.b Quelles difficultés as-tu approuvé pour recevoir la reconnaissance et l'appréciation de votre travaux et efforts par votre entraîneur durant le processus de guérison

Très difficile 1.....2.....3.....4.....5 Très facile

4.4.c Combien important penses-tu que votre entraîneur à montrer la reconnaissance et l'appréciation de votre travaux et efforts durant le processus de guérison

Moins important 1.....2.....3.....4.....5 Très important

4.5.a Comment étais-tu satisfait par les challenges de votre entraîneur pour motiver vos pensées et augmenter votre participation dans diverses activités de votre équipe durant le processus de guérison

Moins satisfait 1.....2.....3.....4.....5 Très satisfait

4.5.b Combien difficiles as-tu rencontré pour accommoder les challenges de votre entraîneur pour motiver vos pensées et augmenter votre participation dans diverses activités de votre équipe durant le processus de guérison

Très difficile 1.....2.....3.....4.....5Très facile

4.5.c Combien important penses-tu que votre entraîneur considère vos pensées et augmenter votre participation dans diverses activités de votre équipe durant le processus de guérison

Moins important 1.....2.....3.....4.....5Très important

4.6.a Combien étais-tu satisfait de l'assistance financière, cadeaux et autres produits par votre entraîneur durant le processus de guérison

Moins satisfait 1.....2.....3.....4.....5Très satisfait

4.6.b Comment difficile as-tu approuvé pour obtenir l'assistance financière, cadeaux et autres produits par votre entraîneur durant le processus de guérison

Très difficile 1.....2.....3.....4.....5Très facile

4.6.c Combien important juges-tu l'assistance financière, cadeaux et autres produits reçus de votre entraîneur durant le processus de guérison

Moins important 1.....2.....3.....4.....5Très important

MESURES POUR LAXITE ARTICULAIRE (AMPLITUDE ARTICULAIRE)

- Coude:.....(> 10 degrés hyper extension)
- Genou:.....(> 10 degrés hyper extension)
- Cheville:.....(> 30 degrés hyper dorsiflexion)
- L'opposition passive du pouce sur l'aspect des fléchisseurs de l'avant-bras ensemble avec l'hyper extension passive des doigts jusqu'à ce qu'ils soient parallèles à l'aspect des extenseurs de l'avant-bras seront aussi utilisés pour confirmer la laxité articulaire. **(Carter & Wilkinson, 1964).**

Merci pour votre participation !

APPENDIX N

Urutonde rw'ibibazo ku mpamvu zijyanye n'imvune zo mu mikino kubagore bakina umupira w'amaguru mu cyiciro cya mbere mu Rwanda.

Nimero y'ubushakashatsi.....

Nyakubahwa mukinnyi,

Wiriweho,

Nitwa Jean Damascene NIYONSENGA ndi umunyeshuri w'umunyarwanda kuri Univerisite ya Cape y'i burengerazuba muri Afurika y'epfo mu ishami rya Fiziyoiterapi. Nkuko bisabwa rero kugirango ubone impamyabushobozi y'ikirenga mu kuvura, ndimo gukora ubushakashatsi ku''**Impamvu zijyanye n'imvune zo mu mikino kubagore bakina umupira w'amaguru mu cyiciro cya mbere mu Rwanda**'' .Ibazava muri ubu bushakashatsi bizadufasha gusobanukirwa neza izo mpamvu n'uburyo bwo kuzirinda muguteza imbere umupira w'abagore utarangwamo imvune.

Ni kuri izo mpamvu mbasaba kugira uruhare muri ubu bushakashatsi musubiza ibibazo byose biri kumugereka w'iyi baruwa nkuko amabwiriza yo gusubiza abibasaba. Ndabibutsa kandi ko gusubiza ibi bibazo ari uburenganzira bwawe kandi ko amakuru yose mutanze ari ibanga rikomeye. Ntimushyireho amazina yanyu cyangwa ikindi cyose cyatuma abandi bakumenya.

Twizeye kandi tudashidikanya neza ko amakuru mutanze muri ubu bushakashatsi azadufasha gusobanukirwa neza impamvu zitera imvune zo mu mikino bikanadufasha gutegura uburyo bwiza bwo kwirinda izo mvune kugirango dukore umupira w'amaguru w'abagore utarangwamo imvune mu Rwanda.

Murakoze cyane kwitabira ubu bushakashatsi.

Jean Damascene NIYONSENGA

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Email: nsengadaj@gmail.com

URUTONDE RW'IBIBAZO BY'ABAKINNYI

Turimo gukora ubushakashatsi kuri ejo hazaza h'umupira w'amaguru w'abagore kurwego rw'igihugu no kurwego mpuzamahanga. Icyo tugamije ni

ukugaragaza no gusuzuma impamvu zose zituma abagore bakina umupira w'amaguru mu cyiciro cya mbere mu Rwanda bagira ibikomere/imvune zijyanye n'umupira w'amaguru. **Ibisubizo byose utanze ni ingirakamaro kuri twe.** Turakwinginze ntiwandike amazina yawe kurupapuro rw'ibisubizo kandi wandike akamenyetso (√) mu kazu bijyanye ngo ugaragaze igisubizo wahisemo. Turongera kukwibutsa ko ibisubizo byawe byose ari ibanga kandi bizatangazwa kuburyo bwizewe kandi budatuma hamenyekana uwabitanze. **Tubashimiye ko mwemeye gufasha muri ubu bushakashatsi.**

1.0 Umwirondoro w'umukinnyi.

1.1 Nomero y'umukinnyi mu

--	--	--	--	--

 bushakashatsi :

1.2 Imyaka.....

1.3 Uburemere..... Kgs

1.4 Uburebure..... Cm

1.5 Igihe watangiriye gukuna umupira w'amaguru

1.6 Ikigero cy'imyaka mpuzamahanga:

Munsi ya 15	Munsi ya 17	Munsi ya 19	Munsi ya 21	Abakuru

1.7 Umwanya umukinnyi akinaho:

	Mu bakabiri	Hagati	Imbere	Mu izamu
Mu ikipi				
Mu ikipi y'igihugu				

1.8 Umwanya w'umukinnyi mu ikipe: Ubanzamo Umusimbura

1.9 Ukuguru akoresha kurusha ukundi: Indyo Imoso

1.10 Undi murimo akora:

1.11 Itariki yakomerekeyeho:

Itariki Ukwezi Umwaka
...../...../.....

1.12 Itariki yisuzumishirijeho:

Itariki Ukwezi Umwaka
...../...../.....

1.13 Itariki yagarukiyeho mu kibuga gukina

Itariki Ukwezi Umwaka
...../...../.....

2.0 Uburyo wavunitsemo

2.1 Ni mukihe gikorwa wavunikiyemo:

- Amarushanwa mu ikipe ya mbere Amarushanwa mu ikipe y'abasimbura
Amarushanwa mpuzamahanga Umukino wa gishuti n'indi kipe nto
 Umukino wo kwimenyereza hagati y'abakinnyi b'ikipe yanjye(11 kuri 11)
 Kwimenyereza uburyo bushya bwo gukina Imyitozo yihariye Ibindi

2.2 Ni mubuhe buryo wagizemo iyo mvune?

- Nteze umukinnyi Banteze Niruka Nteye umupira Nsimbutse
 Ngaruka hasi Nteje umutwe Mpindukira Ngonganye n'abandi
 Nyuma y'umunaniro urengeje

2.3 Igihe wavunikiyemo:

	0-15 iminota	16-30 iminota	31-45 iminota	46-60 iminota	61-75 iminota	76-90 iminota	>90 iminota
Irushanwa							
Imyitozo							

2.4 Kwimenyereza bimara igihe kingana gite ku nshuro imwe:.....I minota.

2.5 Nyuma yo gukomereka,wakomeje imyitozo/umukino kugeza birangiye?:Yego Oya

Niba utarakomeje ngo urangize,wahagaritse nyuma y'igihe kingana gute?.....

.....

2.6 Imiterere y'ikibuga cy'imyitozo n'imikino y'amarushanwa

Ikibuga cy'imyitozo:

Ibyatsi Tapi Umusenyi Inzu zabigenewe Ibihe byose(mu mvura/muzuba) Ibindi

Ikibuga cy'imikino y'amarushanwa :

Ibyatsi Tapi Umusenyi Inzu zabigenewe Ibihe byose (mu mvura/mu zuba) Ibindi

2.7 Uko ikibuga cyari kimeze uvunika:

Cyumagaye Gitose Gikomeye Cyoroshye

2.8 Ikoreshwa ry'ibikoresho mu kwirinda imvune:

Inkweto za bugenewe: Yego Oya

Ibirinda umurundi: Yego Oya

Ibirinda ingingo: Yego Oya

Niba ari yego, izihe ngingo,.....

.....

.....

.....

2.9 Uburyo bwo gushakisha no kwemeza ubwoko bw'imvune: Yego
Oya

Niba ari yego, tanga ibisobanuro
bihagije,.....

.....

.....

2.10 Ibikomere byo kumutwe:

Gutakaza ubwenge: Yego Oya

Kwibagirwa mbere cyangwa nyuma yo gukomereka : Yego Oya

Kohereza umukinnyi kwa muganga: Yego Oya

Umukinnyi se yaba yararaye mu bitaro kubera iyo mvune: Yego Oya

Hari ibindi bimenyetso byakurikiye iyo mvune yo kumutwe: Yego Oya

2.11 Waba warigeze gukomereka kuri kimwe muri ibi bice by'umubiri bikurikira:

Umugongo Iyasha Itako Ikibero Ivi Ukuguru Ikirenge

Amano Ijosi Urutugu Ukuboko Inkokora Ikiganza

intoki

Niba ari yego, tanga ibisobanuro birambuye,.....

.....

2.12 Hari ubuvuzi yakorewe kubera icyo gikomere Yego Oya

Niba ari yego, ni ubuhe buvuzi yakorewe:

Kugiti cye Gakondo Muganga Fiziyo Muganga na Fiziyo

Ubundi

2.13 Ni inshuro zingahe yagiye kwivuza kandi mugihe kingana iki?

Inshuro Igihe

2.14 Ese iyi mvune yaba ari ukugaruka kwindi mvune wari waragize mbere? Yego

Oya

2.15 Niba ari yego, niryari wari waragarutse mu gukina uvuye muri iyo mvune ya mbere?

Itariki Ukwezi Umwaka

...../...../.....

2.16 Ni nde ufata icyemezo cy'uko umukinnyi wari waravunitse agaruka mu kwitoza/gukina?

We ubwe Umutoza Umufiziyo w'ikipi Dogiteri w'ikipi
Ushinzwe imyitozo y'ingufu Abashinzwe ikipi bose hamwe Abandi

2.17 Mbese mwaba mukora ibi bikurikira mu gihe cy'imyitozo/imikino?

Kwishyushya Kurambura imikaya Kuruhuka Gukomeza imikaya
 Imyitozo poliyometirike Imyitozo y'ubwenge mu kibuga

Niba ari yego, ni nka

Kangahe: burigihe Hafi buri gihe Kenshi Rimwe na rimwe
Ntanarimwe

Igihe kingana gute: <5 iminota 5-10 iminota 11-15 iminota 16-
20 iminota >20 iminota

3.0 Ibijyanye n'imihango y'abagore

3.1 Ni mukihe gihe cy'ukwezi kw'imihango yawe wagiriyemo iyo mvune?

Mbere y'imihango Mugihe cy'uburumbuke Mu mihango Nyuma
y'imihango

Tanga

ibisobanuro

birambuye,.....

.....

3.2 Ukoresha se ibini byo kuboneza urubyaro? Yego Oya

Niba ari yego, kuva ryari?.....

3.3 Hari ibimenyetso se ugira bibanziriza imihango yawe? Yego Oya

Niba ari yego, ni

ibihe?byandike,.....

4.0 ubufasha busanzwe n'inkunga.

4.1 a Ni gute wanyuzwe nukuntu umutoza wawe akumva kandi akugira inama nta
kugucira urubanza mu gihe wari mu mvune?

Nyuzwe buhoro 1.....2.....3.....4.....5 Nyuzwe cyane

4.1.b Byakurushyaga kungana gute kugirango umutoza wawe akumve kandi
akugire inama mugihe wari uri mumvune

Biruhanije cyane 1.....2.....3.....4.....5Kuburyo
bworoshye cyane

4.1.c Ni kuruhe rugero utekereza ko kumvwa n'inama z'umutoza wawe
byagufashije mu kumva umeze neza no gukira imvune wari wagize?

Rudahagije cyane 1.....2.....3.....4.....5 Ruhagije
cyane

4.2.a Wanyuzwe bingana gute nukuntu umutoza wawe yakweretse kukuba hafi no kukwitaho mu gihe wari uri mumvune?

Nyuzwe buhoro 1.....2.....3.....4.....5 Nyuzwe cyane

4.2.b Byakurushyaga bingana gute kugirango ubone ko umutoza wawe akuri hafi kandi akwitayeho mugihe cyose wari mu mvune?

Biruhanije cyane 1.....2.....3.....4.....5 Kuburyo
bworoshye cyane

4.2.c Ni kukihe kigero ukeka ko umutoza wawe yakubaye hafi no ku kwitaho mu gihe wari mu mvune?

Rudahagije cyane 1.....2.....3.....4.....5 Ruhagije
cyane

4.3.a Wanyuzwe bingana bite n'uburyo umutoza wawe yagufashije kuyobora imyumvire yawe, imyitwarire n'ibyumviro byawe biganisha kugukira neza imvune wari wagize?

Nyuzwe buhoro 1.....2.....3.....4.....5 Nyuzwe cyane

4.3.b Ni ugukomera bingana bite wabonye ko umutoza wawe atagufashije kuyobora imyumvire, imyitwarire n'ibyumviro byawe kuganisha kugukira imvune wari ufite?

Biruhanije cyane 1.....2.....3.....4.....5 Kuburyo
bworoshye cyane

4.3.c Ni agaciro kangana gute utekereza ko umutoza wawe yagufashije kuyobora imyumvire yawe, imyitwarire n'ibyumviro byawe kuganisha kugukira imvune wari wagize?

Rudahagije cyane 1.....2.....3.....4.....5 Ruhagije
cyane

4.4.a Wanyuzwe kungana gute n'uburyo umutoza wawe yahaye agaciro kandi yibutse akamaro wagiriye ikipe mbere mugihe cyose wamaze mu mvune?

Nyuzwe buhoro 1.....2.....3.....4.....5 Nyuzwe cyane

4.4.b Ni ukuruhanya kungana gute wabonye ko umutoza wawe yibuka kandi aha agaciro akamaro kose wagiriye ikipe mbere mugihe wamaze mu mvune?

Biruhanije cyane 1.....2.....3.....4.....5 Kuburyo
bworoshye cyane

4.4.c Ni kukihe kigero utekereza ko umutoza wawe aha agaciro kandi yemera akamaro wamariye ikipe mbere muguhe cyose wamaze mu mvune?

Rudahagije cyane 1.....2.....3.....4.....5 Ruhagije
cyane

4.5.a Ni ukunyurwa kungana gute wagize k'uburyo umutoza wawe yagushishikarizaga no gutekereza ukuntu wagaragara mu bikorwa by'ikipe no mugihe wari ukiri mumvune?

Nyuzwe buhoro 1.....2.....3.....4.....5 Nyuzwe cyane

4.5.b Ni ugukomera kungana gute wagize kukwihanganira uburyo umutoza wawe yagusabaga gutekereza no kugaragara mu bikorwa by'ikipe mugihe wari ukiri mu mvune?

Biruhanije cyane 1.....2.....3.....4.....5 Kuburyo
bworoshye cyane

4.5.c Ni kukigero kingana gute utekereza ko umutoza wawe yahaga agaciro ibitekerezo n'ibyifuzo byawe mu kugaragara mu bikorwa by'ikipe igihe wari ukiri mu mvune?

Rudahagije cyane 1.....2.....3.....4.....5 Ruhagije
cyane

4.6.a Wanyuzwe bingana gute n'ukuntu umutoza wawe yagufashije kubona amafaranga, impano n'ibikoresho mugihe wari ukiri mu mvune?

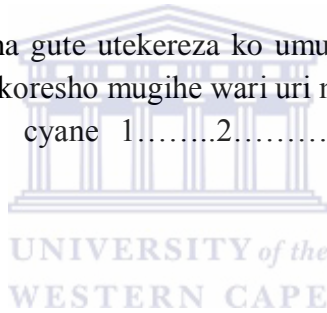
Nyuzwe buhoro 1.....2.....3.....4.....5 Nyuzwe cyane

4.6.b Ni(ukuruhanya) ugukomera kungana gute wabonye k'umutoza wawe mu kugufasha kubona amafaranga, impano n'ibikoresho mugihe wari uri mu mvune?

Biruhanije cyane 1.....2.....3.....4.....5 Kuburyo
bworoshye cyane

4.6.c Ni kurwego rungana gute utekereza ko umutoza wawe yagufashije kubona amafaranga, impano n'ibikoresho mugihe wari uri mu mvune?

Rudahagije cyane 1.....2.....3.....4.....5 Ruhagije
cyane



Murakoze cyane kwemera gufatanya natwe muri ubu bushakashatsi.

APPENDIX O

INTERVIEW GUIDE FOR COACHES

1. After how long do you expect an injured player to return to training/competition after a previous injury?
2. Who is responsible for decisions regarding return to sports? What influences this decision?
3. Have you ever felt a need of assistance from somebody else to make a final decision of an injured player to return to training/competition?
4. What kind of assistance do you provide to injured players during rehabilitation process?
5. How do you assist injured player to return to sporting activities and cope?

Thanks for the participation of this study.

