

**FACTORS INFLUENCING IMPLEMENTATION OF SOCCER INJURY  
PREVENTION STRATEGIES IN RWANDA**

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## ABSTRACT

**Background:** Three epidemiological studies conducted in Rwanda have highlighted that many people at different levels in the community of soccer do not implement accepted control measures for reducing the risk of injuries. However, little is known about what soccer community members themselves know about injury prevention. **Purpose:** The aim of this study was to identify perceptions of factors influencing the implementation of soccer injury prevention strategies in Rwanda. **Methods:** A cross-sectional, descriptive, quantitative study design was used among 12 male first division teams in Rwanda. Four types of self administered questionnaires designed for 360 soccer players, 12 team coaches, 12 team leaders and 12 team therapists were used for data collection. Instruments whose validity and reliability were established were piloted and reviewed by an expert in the field and by experienced coaches working as technical advisors in the federation. The instruments were further discussed with selected participants from the pilot study for their quality, clarity and time consumption. Data was analysed using the Statistical Package for Social Science (16.0) as well as Microsoft excel. Ethical clearance was granted by the University of the Western Cape and from relevant authorities in Rwanda. Participation was voluntary. Participants anonymity and confidentiality was assured and participants had the right to withdraw from the study at any time without any impact. **Results:** At the end of the study, 313 soccer players, 10 coaches, 9 leaders participated and 11 medical personnel participated in this study. Soccer players, coaches and team leaders in Rwanda have satisfactory knowledge of injuries. However, soccer players' awareness is deficient as to the causes and risk factors of injuries, the use of cool down after training and competition, stretching and flexibility, and strength and conditioning. Injury prevention strategies and/ or policies were not regularly implemented. Prevention strategies like warm up, use of protections, water and carbohydrate intake were sufficiently performed during competition than during training whereas cool down and stretching exercises were performed more in training than in competition.

Team coaches, medical personnel and media were identified to be the most important sources of information for players, coaches and leaders respectively. The reported reasons for not implementing injury prevention strategies include lack of proper equipment and advice on techniques, lack of enough time and tiredness after competition. **Conclusion:** Interventions directed to the soccer community members in the form of health promotion programmes through education to increase their knowledge and support for the proper implementation of all prevention strategies are necessary. Clubs should develop, implement and monitor a comprehensive sport safety plan paying particular attention to the development and implementation of policies which involve all issues at training and at competition.



## DECLARATION

I hereby declare that: “**Factors influencing implementation of soccer injury prevention strategies 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 the sources used or quoted have been indicated and acknowledged by complete references.

November 2008

Signature: .....

Assuman Nuhu



Witness: .....

Mr. Hamilton Pharaoh

## DEDICATION

To my father MWALIM ASSUMAN MUSSA and my mother MUKARUZIMA ZUHRA

*“My Lord, Have mercy on them both as they did care for me when I was little”*

Qur'an, Surat 17: Verse 24



## ACKNOWLEDGEMENTS

I am eternally grateful to God for His mercy, blessings, and protection.

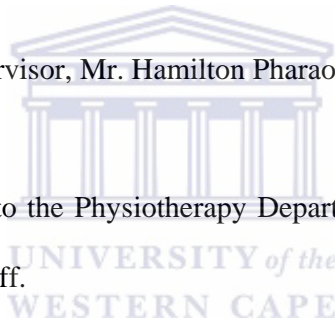
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## KEYWORDS

Injury prevention

Soccer

Rwanda

Knowledge

Soccer players

Soccer community members

Safety policies



## ABBREVIATIONS

ACL:	Anterior Cruciate Ligament
CAF:	Confédération Africaine de Football
CECAFA:	Central and East African Football Association
FIFA:	Fédération International de Football Association
F-MARC:	FIFA-Medical Assessment and Research Centre
IOC:	International Olympic Committee
MISPOC:	Ministère du Sport et Culture
NATA:	National Athletic Trainer's Association
PNF:	Proprioceptive Neuromuscular Facilitation
RCT:	Randomised Controlled Trial
SD:	Standard Deviation
SIRC:	Social Issues Research Centre
UNICEF:	United Nations International Children's Emergency Fund.
WHO:	World Health Organization

## **CHAPTER ONE: INTRODUCTION**

### **1.1 INTRODUCTION**

This chapter presents the background of the present study which is about “the perceptions of factors that influence the implementation of soccer injury prevention strategies in Rwanda”. The chapter also contains the statement of the problem, research questions, aim of the study, objectives of the study, significance of the study as well as a definition of terms used in the study. The chapter ends with the summary of other chapters of the thesis.

### **1.2 BACKGROUND OF THE STUDY**

Soccer, otherwise known as football, is a ball game which involves two teams of eleven players each who attempt to propel the ball through a set of goal posts while preventing the other team from doing the same (Online Encyclopedia, 2007). It is played by kicking, heading, or using any part of the body except the arms and hands with only the goalkeeper allowed to use hands and arms. The game consists of two halves of 45 minute each, with a 15 minute rest interval between the two halves (Putukian, 2000).

Soccer is a vigorous, high intensity, intermittent ball and contact sport (McGrath & Ozanne-Smith, 1997). It is a sport that alternatively uses walking, jogging, running and sprinting (Bloomfield, Polman, & O'Donoghue, 2007). This game requires bursts of speed and power and includes frequent collisions with other players, the ball and the playing surface (Larson, Pearl, Jaffet, & Rudawsky, 1996). Hence, it is not surprising that as a result of its high intensity and 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).

Soccer is the most widely played sport in the World (Junge & Dvorak, 2004). According to the Federation of International Football Association (FIFA), the global governing body of soccer, there were more than 240 million players in the year 2000 (Junge, Rosch, Peterson, Grafbaumann, & Dvorac, 2002). The simple rules and minimal equipment requirement of soccer contributes to its widespread appeal (Junge & Dvorak, 2004). Soccer is accessible almost anywhere in Africa and can be played by almost any healthy young person. Junge, Khouaja, and Dvorak (2004, p. 1) summarized this in simple words as “football is football”. They further explained that soccer is the same no matter where it is played. More so, the pattern of play does not differ as well as scoring, tactics, skills, fitness, to mention but a few factors, no matter where the game is played (Junge & Dvorak, 2004).

Participation and interest in soccer continues to grow in every part of the globe (Waldén, Hägglund, & Ekstrand, 2005a; Leininger, Knox, & Comstock, 2007; Canadian Soccer Association, 2003; Yoon, Chai, & Shin, 2004). This trend is seen in Africa where soccer evokes great passions. It also plays an important role in the life of individual fans, local communities and nations (SIRC, 2008).

Few studies have been done to ascertain the number of people participating in soccer in Africa, but without doubt soccer is the most popular sport on the continent. This notion is supported by the People’s Daily Online newspaper (September 16, 2006), which reported that soccer is the most popular sport in every African country, although rugby and cricket are also popular in countries such as South Africa.

According to the Confederation of African Football (CAF) (2006), African teams and players have gained solid international reputation with hundreds of players from all over Africa playing in professional soccer teams in Europe. The lure of European football is extremely

enticing for African players and many perceive making it in Europe as one of the few opportunities to escape the harsh economic realities of life in many parts of the African continent (The Globalist, November 21, 2005).

The increase in the number of people participating in soccer is also prominent in Rwanda (FIFA, 2008a). This might be explained by the increase in level of football in Rwanda where before 1994, the national team and clubs were considered to be ‘underdogs’ of African football but are presently rated to be good enough to compete with the more experienced teams on the continent (Nkuutu, 2008).

In addition, the government of Rwanda through the Ministry of Youth and Sports (MISPOC) has significantly increased its involvement in the national team. For instance, the national team was sponsored by the government for a training tour of Germany during the qualifying campaign of Tunisia 2004 African Nations’ Cup. Therefore, it was not surprising when the Rwandese National team qualified for the competition of that year (Mugabe, 2008). Moreover, the “Fédération Rwandaise de Football Association” (FERWAFa) started a youth programme some years back which strengthened the participation of young players in the second and third division teams. Hence, soccer became the fastest growing team sport in the country. The national league consists of twelve male soccer teams in the first division while twenty teams compete in the second division and forty-six teams in the third division with each team having a junior team. However, female football is in its embryonic stage with eight registered teams (FERWAFa, 2008).

Rwandan soccer is now progressing to a semi professional level due to the fact that the league is now sponsored by a large business company. Secondly, a number of the teams are sponsored

either by private business companies or government institutions (for example, the police, the army and other governmental parastatals) (FERWAFWA, 2008).

The participation of players in African club championships, while some of players are selected in the national team, leads to increase in number of matches they play which predisposes them to injuries (Twizere, 2004).

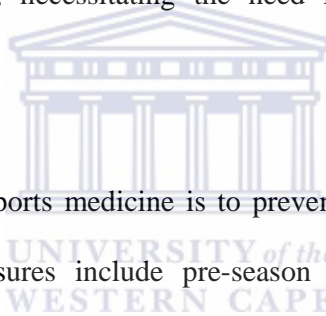
As in the case of other sporting activities, in soccer, there has been an increase in the number of people at risk of injuries due to the upsurge in participation (Leininger et al., 2007), thus making the prevention of injury more important (Emery & Meeuwisse, 2006). Therefore, epidemiologically valid studies which analyze such injuries are required to help reduce the rate of soccer-related injury to the lowest possible level (Leininger et al., 2007).

From a public health perspective, the average cost for medical treatment per injury is estimated at US \$ 150 in Europe (Dvorac & Junge, 2000). Although this amount may far exceed the one incurred by Rwanda teams, players sustain more or less the same injuries. Thus, there is need for preventive measures as Rwandan soccer players might have more difficulties managing their injuries due to minimal resources, thereby making them spend long periods without playing and might end their careers prematurely.

A number of studies have been conducted in the field of soccer-related injuries, some have assessed the characteristics of the players (Junge, Dvorac, Chomiak, Peterson, & Graf-Baumann, 2000; Junge et al., 2000; Rosch et al., 2000), others have assessed the frequency and characteristics of injuries (Dvorac & Junge, 2000; Junge, 2000; Junge & Dvorac, 2000; Junge, Chomiak, & Dvorac, 2000; Chomiak, Junge, Peterson, & Dvorac, 2000; Yoon et al., 2004) and finally some have assessed the risk factors and causes of injuries (Dvorac et al.,

2000; Fuller, Smith, Junge, & Dvorak, 2004; Gisa, Fuller, Junge, & Dvorak, 2003). Van Mechelen, Hlobil and Kemper (1992) suggest that preventive measures should be based on epidemiological research, and the first step in injury prevention in a given sporting activity should be the establishment of the extent, incidence, severity and profile of injury.

In Rwanda, epidemiological studies have been conducted which focused on the prevalence, types, severity and management of soccer injuries (Hakizimana, 2002; Nuhu, 2004), and the need for physiotherapy intervention (Twizere, 2004). According to Hägglund, Waldén and Ekstrand (2004), the definition of injury and methods of data collection often vary between studies based on the initial aim of such studies. However, these studies concluded that the number of injuries were high, necessitating the need for prevention and recommended intervention.



The primary responsibility of sports medicine is to prevent injury (Brukner & Khan, 2003). Some general preventive measures include pre-season screening and testing (Kibler & Chandler, 1993); warm up and cool down exercises (Best & Garrett, 1993); strengthening (Chandler & Kibler, 1993) and flexibility exercises (Cabbie, Brunell, Finch, Wajswelner, & Orchard, 2006; Stanish & Mc Vicar, 1993); proprioception and coordination training (Tropp, Alaranta, & Renstrom, 1993); the use of protective equipment and taping (Brukner, 1993); improvement in nutrition and diet (Deakin & Brotherhood, 1992); good psychological preparation and adequate rehabilitation (Oakes, 2003). Studies conducted by Hakizimana (2002), Nuhu (2004) and Twizere (2004) show that many soccer players were not implementing the proposed control measures available for reducing the risk of injuries. In a similar manner, little is known about what soccer community members actually know regarding injury prevention or how such information is obtained.

Medical practitioners in Rwanda were introduced to the concepts of sports medicine at seminars organized by FIFA (1998), the International Olympic Committee (IOC) (1999) and the Confederation of African Football (CAF) (2000) (Twizere, 2004). Since then, there have been no other initiatives to update the knowledge of team medical practitioners. Therefore, some of them may have little knowledge as regards the occurrence, management and prevention of injuries. This might lead team leaders and coaches to underestimate their importance in the team. This may also explain why there are no medical practitioners attending to the teams.

A number of studies have been done to assess injury prevention strategies, such as multi-component prophylactic training programme (Olsen et al., 2004), the effectiveness of the proprioceptive programme on the reduction of knee injuries (Soderman, Werner, Pietilä, Engström, & Alfredson, 2000; Caraffa, Cerulli, Progetti, Aisa, & Rizzo 1996; Hewett, Lindenfeld, Riccobene, & Noyes, 1999; Mendelbaum et al., 2005), the effects of emergency preventive measures on heat exhaustion (Elias, 2001), the effect of strength training on the incidence of injuries (Lehnhard, Lehnhard, Young, & Butterfield, 1996), the effects of training with eccentric overload (Askling, Karlsson, & Thorstensson, 2003), as well as the use of orthosis on the ankle joint (Surve, Schweltnus, Noakes, & Lombard, 1994). Although these studies vary substantially in the characteristics of the study population and the type of intervention, they suggest that strategies designed to prevent soccer injuries can be effective.

However, no injury prevention study has been done in Rwanda. There is also minimal knowledge of the awareness level within the soccer community as regards injury prevention. Moreover, it is contemplated that limited knowledge exist among soccer community members in Rwanda as to the causes, risk factors, mechanisms, severity as well as prevention strategies



of injuries. Therefore, the need to collect what is known about the prevention of injury in soccer becomes highly necessary.

For the purpose of this study, soccer community members refer to players, coaches, team therapists, team leaders, referees and fans. The present study will focus on players, coaches, team therapists who are the main actors and team leaders as decision makers in the field of soccer.

From Hawkins and Fuller's (1998a) observation, many people at different levels in the community of soccer are not aware of different prevention strategies for reducing the risk of injury. This was further emphasized by Twizere (2004) who suggested that lack of knowledge of the importance of warm up and cool down in injury prevention as well as poor flexibility and strengthening exercises predisposed Rwandan soccer players to injuries.

However, there were no studies which have been carried out to assess the factors that influence implementation of soccer injury prevention. In addition, there is neither an intervention nor study which has been done in Rwanda to enhance the knowledge or implementation of injury prevention strategies. Therefore, this study will examine factors associated with implementation of soccer injury prevention strategies among soccer community members.

### **1.3 STATEMENT OF THE PROBLEM**

Soccer community members in Rwanda may have low level of knowledge regarding injury prevention as well as poor implementation of different injury prevention strategies. At the same time there is no study which has been done to assess their knowledge and factors influencing the implementation of injury prevention strategies.

## **1.4 RESEARCH QUESTIONS**

1. What is the general knowledge of soccer players, team coaches and team leaders about injury prevention?
2. What is the source of knowledge regarding injury prevention of soccer players, team coaches and team leaders?
3. What are the factors influencing the implementation of injury prevention strategies in Rwanda?

## **1.5 AIM OF THE STUDY**

The aim of this study is to identify factors associated with the implementation of soccer injury prevention strategies in Rwanda.

## **1.6 OBJECTIVES OF THE STUDY**

1. To identify and describe the general knowledge of soccer players, team coaches and team leaders about injury prevention.
2. To identify and describe implementation of injury prevention strategies in Rwanda.
3. To establish the source of knowledge of soccer injury prevention of soccer players, team coaches and team leaders in Rwanda.
4. To identify the factors that influence the implementation of injury prevention strategies.

## **1.7 SIGNIFICANCE OF THE STUDY**

The first step towards injury prevention, as explained by Cabbie et al. (2006), is the knowledge of risk factors based on etiological evidence rather than unreliable notions. This has been explained by Van Mechelen et al. (1992) that the magnitude of the problem must be identified

and described in terms of incidence and severity of sports injuries while the second step is to identify the risk factors and injury mechanisms that play a part in the occurrence of sports injuries. This study acted as a complement to other epidemiological studies conducted in Rwanda which focused on the first two stages in the process of injury prevention by highlighting the level of awareness and implementation of soccer community members about injury prevention.

It has been established that several preventive programmes have been effective to reduce the incidence of injuries (Heidt, Sweeterman, Carlonas, Traub, & Tekulve, 2000; Junge et al., 2002; Mendelbaum et al., 2005); however, from the researcher's knowledge there is no intervention of any form done in Rwanda aiming at reducing the risk for injuries. The present study highlights the need for further education and implementation of injury prevention interventions among soccer community members in Rwanda. Team medical personnel, including physiotherapists, can play a big role in the education of soccer community members to enhance their knowledge and support in implementation of all prevention strategies either in training or in competition based on the results of this study. Furthermore, this study could serve as a tool to assess the general awareness and implementation of injury prevention strategies.

## **1.8 DEFINITION OF TERMS**

**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 any part of the body except the arms and hands. Only the goalkeeper, when positioned within the penalty area in front of the goal, may use hands and arms (Online Encyclopedia, 2007). In this study the terms soccer and football are used interchangeably.

**Soccer Injury:** any physical complaint caused by soccer (Junge & Dvorac, 2000).

**Injury prevention:** the implementation of interventions to reduce the occurrence and the severity of bodily injuries caused by external or internal mechanisms before they occur (Lawrence, 2008).

## **1.9 SUMMARY OF CHAPTERS**

Chapter one describes the basis of the present study. This includes the overview of the studies conducted in soccer worldwide and in Rwanda, the motivation of the study, the significance of the study and the aim and objectives of the study.

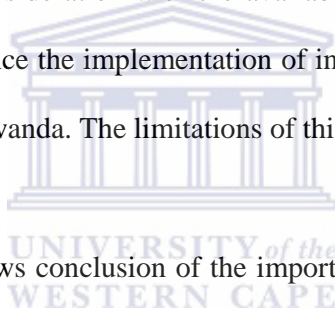
In chapter two, the epidemiology of soccer injuries is reviewed; the possible preventive measures are highlighted and prevention studies in the field of soccer are reviewed. Role players and responsibilities of each club stakeholders are highlighted as well as factors influencing implementation of injury prevention. This chapter details the health promotion approach which could be incorporated in the domain of sports especially in soccer.

In chapter three the research setting is described as well as the structure of soccer in Rwanda. The chapter presents the design of this study, which is a cross-sectional retrospective study design. It thereafter gives the details concerning the study population and sampling techniques. The procedures of the pilot studies are highlighted. An in-depth description of data collection methods is presented. Furthermore, the chapter describes the tools used in data collection, data collection procedures and issues of reliability and validity of the questionnaires. The chapter ends by giving the data analysis and by showing how the issues of ethical considerations were addressed.

In chapter four, the demographic characteristics of the participants are reported. The presentation and brief description of the main findings in this study are displayed. These include the general knowledge and the implementation of injury prevention strategies. Sources of knowledge and factors influencing the implementation of injury prevention strategies are also presented.

In chapter five, the entire discussion focuses on the interpretation of the main findings in this study. The general knowledge of soccer players, team coaches and team leaders about injury prevention as well as the sources of information regarding injury prevention are discussed comparing the findings, with the previous studies. The implementation of injury prevention strategies is also discussed in consideration with the available evidence. The final discussion focuses on the factors that influence the implementation of injury prevention strategies among soccer community members in Rwanda. The limitations of this study are also reported.

The last chapter summarizes, draws conclusion of the important results from the research and gives suggestions for practice and future studies.



## CHAPTER TWO: LITERATURE REVIEW

### 2.1 INTRODUCTION

This chapter presents a review of the literature regarding the epidemiology of soccer injuries. Under this section, the definition, occurrence, types, anatomical location, causes, risk factors and methodologies used in the assessment of injuries are discussed. The chapter also highlights the possible preventive measures and reviews studies conducted to assess the effectiveness of these measures in the field of soccer. The role of the different stakeholders at the clubs in implementing injury preventive measures, as well as factors influencing their ability to implement these measures are highlighted. This chapter ends with an overview of measures which promote good health that can be incorporated in the domain of sports (especially in soccer).

### 2.2 SOCCER INJURY EPIDEMIOLOGY

The primary concern of epidemiology in sports medicine is to quantify the occurrence of injuries with respect to the athletes, the anatomical location and the mechanism of injuries and their outcome in order to identify strategies to control and prevent them (G. Caine, J. Caine, & Lindner, 1996).

#### 2.2.1 Definition of injury and research methods

According to Hägglund, Waldén and Ekstrand (2004), the definition of injury varies between studies depending on its purpose. Therefore, different definitions of injuries have been used in different studies. Injury has been defined as any condition that causes a player to be removed from or miss training or a match (Kibler, 1993; Hawkins & Fuller, 1999; Ekstrand & Karlsson, 2003; Ekstrand, Waldén, & Hägglund, 2004; Hawkins, Hulse, Wilkinson, Hodson, & Gibson, 2001), or to be so disabled enough as to require medical attention (Junge,

Dvorak, & Graf-Baumann, 2004; Morgan & Oberlander, 2001) or sustaining tissue damage (Junge, Dvorak, Graf-Baumann, & Peterson, 2004). Hagglund (2007) classified the three types of definition as “time loss”, “medical assistance” and “tissue injury” respectively.

Following the shortcomings of each definition associated with the difficulties to compare different studies, Ekstrand and Karlsson (2003) suggested that injuries must be defined in a similar way in order to allow valid comparison between studies. That is why, two years later, the Union of European Football Association (UEFA) medical committee reached a consensus and decided to use a “time loss” definition. They defined an injury as an incident that occurred during a scheduled training session or match that caused absence from the next training session or match (Hägglund, Waldén, Bahr, & Ekstrand, 2005). Sometime later, the Federation of International Football Association (FIFA) established an injury consensus group under the FIFA Medical Assessment and Research Centre (F-MARC) and defined an injury as any physical complaint sustained by a player that results from a football match or football training, irrespective of the need for medical attention or time loss from football activities (Fuller et al., 2006). Both definitions considered injury severity as the number of days that have elapsed from the date of injury to the date of player’s return to full participation in team training and availability for match selection.

Beside different definitions of injury being used, different methods have been used to collect data. Some methods of data collection in the literature include the use of questionnaires or forms to record injury (Orchard & Seward, 2002), video records (Andersen, Floerenes, Arnason, & Bahr, 2004) or physical examination by doctors, physiotherapists or the researchers (Junge et al., 2002).

Other possible approaches listed by Krosshaug, Andersen, Olsen, Myklebust, and Bahr (2005) were athlete interviews, clinical studies (radiography, MRI, and CT), video analysis, laboratory motion analysis, in vivo strain/ force measurements, injuries during biomechanical experiments, cadaver and doming studies, and finally mathematical modeling. However, for most injury types, no single research approach is adequate in terms of validity, accuracy and completeness of information provided. It was therefore suggested that different research approaches should be used to describe the mechanisms fully, for example the combination of interviews, video analysis and clinical studies.

### **2.2.2 Soccer injuries**

According to Emery (2005), prior to examining potential prevention strategies in sport, there is a need for a good understanding of the extent of the problem (incidence rates for injury), who is at risk (sport participation), and risk factors for injury in the population.

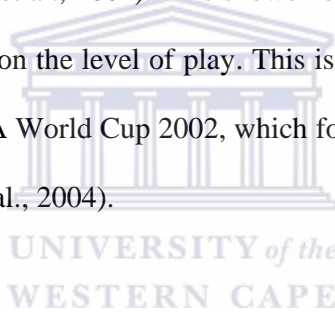
#### **2.2.2.1 Incidence of soccer injury**

Drawer and Fuller (2002) estimated, based on a study conducted among male professional football players in England, that the risk of injury in professional football was approximately 1000 higher than that observed in high risk industrial occupations like construction, manufacturing, and service sectors of industry.

According to Wong and Hong (2005), the definitions of injury rate and injury percentage should be separated in order to facilitate the ability to examine injury risk factors as well as making comparisons across studies. Injury rate is defined as the number of injuries per 1000 hours of player activity time, or number of injuries per 1000 athlete exposure (Dvorac & Junge, 2000; Inklaar, 1994; Van Mechelen et al.,1992), while injury percentage is defined as the number of injured players divided by the total number of players (Wong & Hong, 2005).



A review conducted by Hagglund (2007) indicates that injury incidence for adult male players ranges between 1.8-7.6 injuries per 1000 training hours and 10.2-35.3 injuries/1000 match hours, and for female adult players between 1.2-7/1000 training hours and 8.7-24/1000 match hours. The results of the study conducted among adolescent soccer players in South Africa found that 19% of players were injured which is equal to 33.2 injuries/10.000 player hours (Frantz, Amosun, & Weitz, 1999). This incidence is higher compared to the findings of the prospective study conducted by Kakaverakis, Vlazakis, Vlahakis and Charissis (2003), among male youth players in Greece which reported that the incidence of injuries was 4.0 injuries per 1000 hours of soccer time per player. The later is slightly lower than the finding of the study conducted amongst Asian football players at both senior and youth level (45.8/1000 hours/player) (Yoon et al., 2004). This shows how the incidence of injuries varies across studies and is dependent on the level of play. This is emphasized by the results of the study conducted during the FIFA World Cup 2002, which found an incidence of 81.0 injuries per 1000 match hours (Junge et al., 2004).

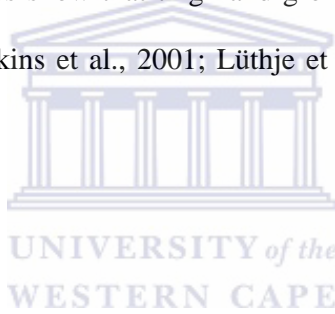


Similar pattern was observed in a study conducted in Rwanda where the prevalence of injuries was 70.8% among first division players while the second division sample showed an injury prevalence of 65.4% (Twizere, 2004). The gaps, paucity and disparity among studies conducted in Rwanda and outside make it difficult to compare the results. Furthermore, the review of literature conducted by Emery (2005) suggested that the variations reported about the occurrence of injuries are to some extent due to methodological differences such as study design, injury definitions, population studied and levels of play.

### ***2.2.2.2 Types and anatomical location of injuries***

#### ***a. Anatomical location of injuries***

A majority of the studies into the prevalence of injury observed that the lower extremities of the body were the most affected especially the ankle joint (Junge et al., 2004) followed by the knee joint (Yoon et al., 2004) and the thigh (Hawkins & Fuller, 1999). According to Wong and Hong (2005), the possible reason for the vulnerability of the ankle joint to injury is its close proximity to the ball which is the focus of the activity in this sport. They therefore further observed that the chances of ankle injury are highest when dribbling, shooting, and tackling. This concurs with the results of Twizere's study (2004) conducted in Rwanda which indicates that the ankle joint was the most affected part (38.5%) followed by the knee joint (26.7%). However, recent studies show that thigh and groin (hip) injuries are also common (Hawkins & Fuller, 1999; Hawkins et al., 2001; Lüthje et al., 1996; Waldén, Hägglund, & Ekstrand, 2005b).



#### ***b. Types of injuries***

According to Junge and Dvorac (2004), the majority of soccer injuries are caused by trauma. Based on the fact that the ankle and knee joint have been observed to be the most affected body parts, traumatic sprains to the ankle and knee were the most frequently encountered injuries (0.6-1.7/1000 hours) whereas muscle strains to the hamstring (0.9-1.5/1000 hours) and groin (0.4-0.6/1000 hours) were less frequent (Ekstrand & Gillquist, 1983; Ekstrand & Tropp, 1990; Nielsen & Yde, 1989; Arnason et al., 2004). However, muscle strains specifically to the hamstrings are now as common as or more frequent than joint sprains (Hawkins & Fuller, 1999; Hawkins et al., 2001; Waldén et al., 2005b). Overuse injuries were reported to be between 9% (Arnason, Gudmundsson, Dahl, & Johannsson, 1996) and 34% (Nielsen & Yde, 1989) of all injuries. According to Waldén et al. (2005b), the lower back,

Achilles tendon, adductor muscles, patellar tendon, and lower leg are the typical sites of overuse injury observed among football players.

### ***2.2.2.3 Causes, mechanisms and risk factors***

Risk factors in sport are any factors which may increase the potential for injury (Caine et al., 1996). Risk factors may be extrinsic (i.e. weather, field conditions) or intrinsic (i.e. age, conditioning) to the individual participating in the sport (Willems et al., 2005).

Analysis of risk factors for sports injuries is required as a prerequisite to define high-risk populations (Caine et al., 1996) and to develop prevention programmes (Willems et al., 2005). A prospective study done by the F-MARC on potential injury predictors created a range of multidimensional predictors score for football injuries (Dvorak et al., 2000). These risk factors covered a wide spectrum of issues such as age, gender, previous injuries, acute complaints, inadequate rehabilitation, poor health awareness, life-event stress, playing characteristics, slow reaction time, low endurance, insufficient preparation for the game. This shows how the causes of injuries are multi-factorial. Therefore, there is a need to evaluate risk factors for injury using a multivariate approach because examining each risk factor separately without controlling other risk factors will not give a complete picture of how each contributes to the development of injury (Meeuwisse, 1994).

**Table 2.1 Potential risk factors for injury in soccer**

<b>Extrinsic risk factors</b>	<b>Intrinsic risk factors</b>
<i>Non-modifiable</i>	<i>Non-modifiable</i>
Soccer (contact sport) Level of play (elite) Position played Weather Time of season/Time of day	Previous injury Age Sex
<i>Potentially modifiable</i>	<i>Potentially modifiable</i>
Rules Playing time Playing surface (type/condition) Equipment (protective/footwear)	Fitness level Pre-participation sport specific Flexibility, Biomechanics (joint stability, strength Balance/Proprioception Psychological/Social factors

Willems et al., 2005

Dvorak and Junge (2000) reported that 44% to 74% of soccer injuries were caused by player-to-player contact. In addition, Ekstrand and Gillquist (1983) reported that mechanisms like excessive inversion forces occurring during jumping, kicking, running, cutting, and tackling activities predisposed players to sustain ankle injuries. The results of the study conducted by Giza, Fuller, Junge, and Dvorak (2003) show that the majority of injuries were caused by tackles. According to the study conducted by Twizere (2004) tackling was the most frequent injury causing mechanism during training sessions (16.8%), followed by collision (13.6%), landing and overuse (10.3%). Collision was the most frequently reported mechanism of injury during competition.

### **2.3 SOCCER INJURY PREVENTION STRATEGIES**

Several authors have discussed a number of prevention strategies including warm up, stretching, regular cool down, adequate rehabilitation with sufficient recovery time, proprioceptive training, protective equipment, good playing field condition, adherence to the rules (Junge & Dvorac, 2004, Ekstrand & Gillquist, 1984), preseason screening, nutrition and hydration (Sando, 1992).

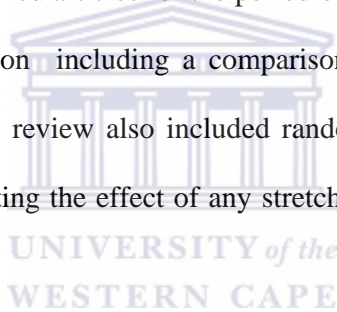
### **2.3.1 Stretching**

Common clinical practices suggest that pre- and post-exercise stretching or flexibility can enhance performance and prevent injuries by increasing flexibility and joint range of motion (Arnheim & Prentice, 1993; Brukner & Khan, 2003). There are three stretching techniques that are frequently used: static, dynamic, and proprioceptive neuromuscular facilitation (PNF) (Shrier, 1999). Static stretching is the most common, and believed to be the safest, and is performed by placing the muscle in its most lengthened position and holding it there for at least 30 to 60 seconds (Shrier, 1999). Proprioceptive neuromuscular facilitation stretching uses combinations of alternating contraction and relaxation of the muscle groups (Shrier & Gossal, 2000). Dynamic stretching consists of controlled body movements that take the limb to the limits of its range of motion (Shrier & Gossal, 2000). Ballistic stretching which incorporates rapid movements and bouncing is discouraged for most sports as during these types of movements the muscles have a greater stiffness and resistance to stretch, which does not help in lengthening the tissues (McCullough, 1990). The safest and most effective time to stretch in order to increase the length of the muscles and improve joint range of motion is just after exercise (Allerheilgen, 1994), as the soft tissues are more elastic and pliable after exercise and consequently more capable of being lengthened safely. This is why stretches at the end of exercise should be held for a longer time than during the warm-up (Allerheilgen, 1994).

A systematic review conducted by Yeung and Yeung (2001), shows that studies which have been done determining the effect of stretching either before or after exercise demonstrated contradictory findings. Likewise, numerous studies documented the effect of stretching on the increase of soft tissue flexibility and joint range of motion (Magnusson, Simonsen, Aagaard, Sorensen, & Kjer, 1996; Harvey, Herbert, & Crosbie, 2002). However, there is inconclusive evidence as to its effect on the reduction of the risk or the occurrence of injuries.

Therefore, the debate continues on whether stretching does influence injury prevention and a review was conducted to investigate the evidence on the effectiveness of stretching on the prevention of injuries in sports.

To further understand the role of stretching in the prevention of injury, a computer search of the literature was conducted in MEDLINE, SCIENCE DIRECT, COCHRANE, EBSCOHOST, SPORTS Discus and CINAHL databases using Stretch\*OR flexib\*; Sprain OR strain OR injur\*; Muscle OR tendon OR ligament; Sport OR athlet\* OR activ\* OR exercis\*; Prevent\* OR avoid\* as key terms. Additional search was conducted by locating pertinent references, contact of the experts and manual search. The inclusion criteria for the review was peer reviewed published articles for the period of January 1998 to April 2008 that used stretching as an intervention including a comparison group, and had some form of injury risk as an outcome. This review also included randomised or quasi-randomised full text accessible studies investigating the effect of any stretching exercise on any sport or any exercise-related activity injury.



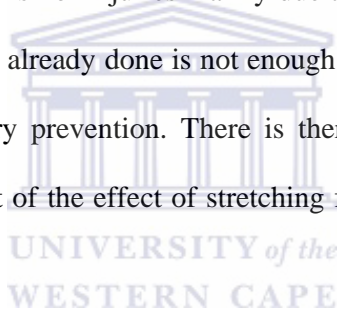
The search generated a total number of 333 articles in which 42 were found potentially relevant to this topic. The 42 articles were further assessed and 38 were excluded because they did not fulfill the inclusion criteria. Therefore, a total number of 4 articles were retained, two RCT's (Pope, Herbe, & Kirwan, 1998; Pope, Herber, Kirwan, & Graham, 2000) and two prospective cohort studies (Arnason, Andersen, Holme, Engegretsen, & Bahr, 2008; Harting & Henderson, 1999). Only one study was conducted among male soccer players (Arnason et al., 2008) while others were conducted among male military basic trainees (Pope et al., 1998; Pope et al., 2000; Harting & Henderson, 1999).

One of the two cohort studies found out that lower extremity overuse injuries was significantly lower in the intervention group (29%) compared with the control group (17%) ( $P=0.02$ ) (RR=0.63, 95% CI 0.41-0.99) and there was a statistically significant difference ( $P<0.001$ ) between the changes in the flexibility of the hamstring muscles between the intervention and the control group following introduction of hamstring stretching added to the normal basic training programme (Harting & Henderson, 1999). The results of this study are different from that of the other cohort study conducted among soccer teams which found no significant difference in the incidence of hamstring strains between the intervention and the control teams (RR: 1.53, 95% CI 0.76-3.08) following hamstring flexibility training (Arnason et al., 2008). Similarly the two RCT's show no significant effect of pre-exercise stretching on the risk of incurring either one of the selected injuries (Pope et al., 1998) or all injuries (Pope et al., 2000). The intervention protocol varied across studies either in duration or type of stretch and the number of sessions per training. The two RCTs and one cohort study by Harting and Henderson (1999) used sustained stretch while Arnason et al. (2008) used hold relax technique. However, their results are in disagreement which could be due to the number of repetitions of the stretches. Harting and Henderson (1999) utilized four stretching sessions per day whereas the two RCTs used only one session. Therefore, it is difficult to draw conclusions by comparing the findings of the RCTs and the cohort study. Likewise, it is difficult to compare these studies to the cohort study conducted by Arnason et al. (2008) which used the hold relax method.

One of the cohort studies which found that stretching might prevent injury is small and of lower methodological quality than the other cohort study which concluded negatively as to the effect of stretching in injury reduction. The two contradicting cohort studies are also of lower methodological quality compared to the two RCTs which did not provide evidence of the protective effect of stretching. Furthermore, the two RCTs were found to have some

limitations such as lack of the use of statistical power (Pope et al., 1998), loss of follow up (Pope et al., 1998; Pope et al., 2000), and withdrawal not mentioned (Pope et al., 1998). One of them (Pope et al., 2000) concluded that on average about 100 people would stretch for 12 weeks to prevent one injury and the average subject would need to stretch for 23 years to prevent one injury. From this, it is obvious that some studies could not find a worthwhile effect of stretching on the reduction of injuries when conducted for a short period of time. Therefore, there is a need for longitudinal studies with duration of several months or years to determine the significant effect of stretching in the reduction of injuries.

In summary, the results of the studies reviewed indicate that stretching exercises does not give a practical reduction in the risk of injuries mainly due to the variations of the studies. In addition, the amount of research already done is not enough to draw definitive conclusion on the effect of stretching in injury prevention. There is therefore a need for well designed studies in this field to shed light of the effect of stretching for reducing the risk of exercise-related injuries mainly in soccer.



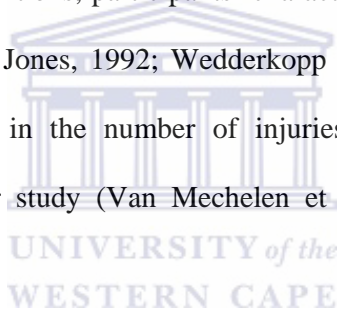
### **2.3.2 Warm up**

Warm-up in sport is defined as a period of preparatory exercise in order to enhance subsequent competition or training performance (Hedrick, 1992). Kannus (1993) opined that the aim of warm-up exercise is to prepare the mind, heart, muscles and joints for the physical activity. He further stated that its benefits would include improved performance, greater psychological preparation, and injury prevention. Safran, Seaber and Garrett (1989) recommended that warming up can include activities like light aerobic exercise, sport-specific exercises and stretching. Ekstrand (1994) furthermore explained the benefits of each period of warm stating that a period of aerobic exercise increases body temperature; a period of sport-specific stretching prepares the muscles to be used in the subsequent performance;



and a period of activity incorporating movements similar to those to be used in the subsequent training or competition prepares the athlete for the game.

Although, no study on the effect of warm up on the risk of injury in soccer was found in the literature, studies conducted in other sports disciplines like handball (Wedderkopp, Kaltoft, Lundgaard, Rosendahl, & Froberg, 1999; Olsen, Myklebust, Engebretsen, Holme, & Bahr, 2005), running (Van Mechelen, Hlobil, Kemper, Voorn, & De Jongh, 1993) and American football (Bixler & Jones, 1992) were found. However, it is difficult to compare these studies because they differ in their methodology especially on the definition of injury which is different in all the studies. Additionally, conclusions could not be made as these studies varied according to their interventions, participants' characteristics and performed activities. Three of the studies (Bixler & Jones, 1992; Wedderkopp et al., 1999; Olsen et al., 2005) reported significant reductions in the number of injuries during physical activity after performing warm-up, the other study (Van Mechelen et al., 1993) did not observe any significant difference.



Although all these studies used the three types of activities which have been recommended to be included in a warm-up routine, there was a great variation of the total time reserved for warm up which varied from 3 to 40 min. Interventions in the studies (Bixler & Jones, 1992; Wedderkopp et al., 1999; Olsen et al., 2005) which found that warm-up significantly reduced the risk of injury had a greater focus on exercise to increase body temperature than the study (Van Mechelen et al., 1993) that found warm-up to be ineffective. The later focused on the stretching aspect and its compliance was very low.

None of all these studies reported the intensity level of the warm-up, which may be a crucial factor in determining whether or not warm up is effective for reducing the risk of injury.

Therefore, it is difficult to draw definitive conclusions as to the role of warm-up for reducing the risk of exercise-related injury. There is a need for well-conducted randomised controlled trials to further evaluate the role of warming up prior to physical activity in relation to injury prevention especially in soccer.

### **2.3.3 Pre-season examination**

Incorrect training and individual player factors such as muscle tightness, mal-alignment, muscle weakness and joint instability are often related to soccer injuries (Ekstrand & Gillquist, 1984) and can be prevented through corrections in training and conditioning (Larson et al., 1996). Ekstrand (1994) suggested that a pre-season examination provides the opportunity to analyse those factors predisposing players to injuries. The author further recommends that a pre-season examination would include an enquiry about past injuries and evaluation of persistent symptoms from past injuries. He finally details a number of important tests which could be performed such as mechanical and functional instability test of joints, malalignment tests and measurement of range of motion and muscle strength.

### **2.3.4 Correction of training**

Preventive training of the musculoskeletal system is the key to both the prevention of injuries and to a successful recovery after an injury (Brukner & Khan, 2003). Specific progressive exercises will improve the mechanical and structural properties of the tissues by increasing their mass and tensile strength. Preventive training includes muscle training, mobility and flexibility training, coordination and proprioceptive training, and sport specific training. Ekstrand, (1994) suggests that correction of training should be done by means of proper warm up, cool down and stretching. He further stated that players detected with muscle tightness should be given additional flexibility exercises during the pre-season training.

### **2.3.5 Cool down**

Although a number of studies have been conducted to investigate the effect of different prevention strategies on injury risk reduction, there is a paucity of studies which have investigated the effect of cool down. Theoretically, its benefit is believed to be of great importance in injury prevention in sports. According to Stamford (1995) cooling down enhances the wash out of the waste products of muscle metabolism hence shortening the recovery time. The author recommended performing light aerobic exercise at the end of the sporting activity for starting the cool-down process. Jogging is ideal for most team sports as well as low-intensity cycling and rowing particularly after gym training sessions (Blum, 2000). Flexibility or stretching exercises are the other important component of the cool-down session since the muscle temperature is still high and can be performed safely and easily (Blum, 2000).



### **2.3.6 Protective equipment and playing surface**

Ekstrand (1994) stated that shin guards, shoes and insoles are important in football. It has been demonstrated that shock absorbent, anatomically shaped shin guards protecting a large area of the lower leg can prevent injuries to the shin bone in football (Ekstrand, 1994). The variety of football shoes available is enormous. Training in improperly fitted or worn-out shoes can result in chronic abnormal pressures to the foot and cause mechanical disturbances and postural, muscular, and joint dysfunctions while the doubling of shock absorption in the soccer shoe could markedly decrease the body loading and overuse injuries (Jorgensen & Ekstrand, 1988). Therefore, Ekstrand (1994) suggested that when selecting footwear, the interaction between the foot and the shoe and the playing surface should be taken into account. Thus the shoe design should match the specific type of the surface being played on to provide optimal traction and support (Weaver, Moore, & Howe, 1996).

It has been documented that the forces transmitted to tissues are changed on different surfaces (Nigg & Yeadon, 1987). Changes in surfaces have had effects on the performance and injury pattern of the sport (Ekstrand & Nigg, 1989). The authors assume that the stiffness property of the playing surface influences the frequency of injuries and recommend that injuries could be avoided or reduced by adequate training, gradual adaptation to a new surface by the use of appropriate insoles and suitable football shoes and by adapting the movement to the surface. They further stated that appropriate equipment improperly used may increase the risk of injury. Moreover, the athlete must understand proper use of the equipment as well as its maintenance, proper fit, and adjustment. Weaver et al. (1996) suggested that it should be the duty of the coach to caution against misuse of the equipment.

### **2.3.7 Environmental conditions**

Extreme heat and humidity, cold, and altitude can adversely affect performance in many athletic events and should be recognised as carrying the threat that may cause serious injury to players (Weaver et al., 1996). Therefore, the environment and surroundings are important factors to consider in injury prevention (McGrath & Ozanne-Smith, 1977). The health and safety of the athlete must be the priority in any practice or competitive situation. If unsafe climatic conditions occur, training should be limited, and practice or competition times rescheduled to allow the safest environment for all participants (Brukner & Khan, 2003).

### **2.3.8 Adequate rehabilitation**

It has been documented that incomplete rehabilitation following sports is a causal factor in the recurrence of sports injuries in sports (Ekstrand, 1994). McGrath and Ozanne-Smith (1997) recommended that players should undergo controlled rehabilitation before returning to play after injury, that a rehabilitation programme should be sport-specific and should involve gradual increase in the stress and adaptation up to full recovery. Return to play should be

decided by team medical personnel in collaboration with the coaches and they should ensure that the risk of further injury is reduced (Ekstrand, 1994).

### **2.3.9 Nutrition**

An increase in the importance placed on the nutritional needs of players as well as knowledge of nutritional strategies for recovery after heavy training will bring about an improvement in the performance (Williams, 1994). Williams (1994) also explains that nutritional support for players will ensure that body weight and composition is well controlled and appropriate for the level of energy expenditure. Maintenance of adequate quantity and quality of diets will help in the preparation and the participation of players to the training or competition as well as ensure adequate recovery. This can be achieved by ensuring that carbohydrate and fluids intakes before and after training and competition are adequate.

### **2.3.10 Hydration**

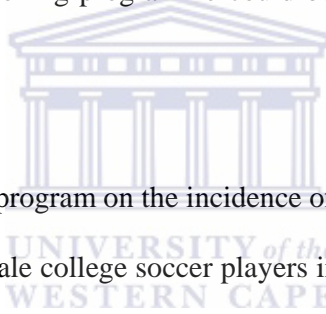
To avoid dehydration and the fatigue that can occur from inadequate fluid replacement, cool water or hydrating solutions of dilute carbohydrate should be available (Monteiro, Guerra, & Leite de Barros, 2003; Brukner & Khan, 2003). Assuring adequate water, and juices or sports drinks provided before, during and after the practice or competition, helps keep the participant energised, focused, and better able to concentrate (Galloway, 1999).

## **2.4 SOCCER INJURY PREVENTION STUDIES**

A vast amount of studies have been done to ascertain the incidence of injuries among soccer players and many of them have attempted to highlight their causes and risk factors (Dvorac et al., 2000, Junge et al., 2000). However, few intervention studies have been done investigating the effect of different prevention strategies. All prevention strategies are not found in the studies conducted on soccer aiming at reducing the risk of injuries. A number of them have

targeted a particular injury type which seems to be most prevalent in soccer by using a specific injury prevention strategy while others have focused on reducing injuries in general using one or more injury prevention strategies.

Heidt et al. (2000) studied the effects of a preseason conditioning program on the occurrence of soccer injuries in high school female players where 42 players were randomly selected to participate in a 7-week Frappier Acceleration Training Program. This training program combined sport-specific cardiovascular conditioning, plyometric work, sport cords drills, strength training, and flexibility exercises. During the 1-year competitive soccer season, the control group experienced a significantly higher incidence of injuries than the trained group. Therefore, the preseason conditioning programme could be of great importance in reducing injuries among soccer players.



The effect of a strength training program on the incidence of injuries has been investigated by Lehnhard et al. (1996) among male college soccer players in a team. They monitored injuries for two years in the absence of the training and for a subsequent two years with a structured strength training regimen incorporated into the non-season and the preseason periods during the third and fourth years. This study indicates that players sustained fewer injuries in two years of strength training (7.99 per 1,000 exposures) than two years without training (15.15 injuries per 1,000 exposures). The researchers did, however, notice an increase in muscle strains. Another study done by Askling et al. (2003) among elite male soccer players, examined the effect of a pre-season strength training program using eccentric hamstring overload. A drop in the incidence of hamstring injuries during the season as well as an increase in both strength and speed was observed in the intervention group compared to the control group.

In a study conducted by Surve et al. (1994) to investigate the incidence of ankle sprains during one season among senior soccer players, it was observed that the use of ankle orthosis had no effect in players without previous ankle sprains, but significantly lower incidence of ankle sprains was observed in players with previously history of ankle sprain. The results obtained were similar to that of Tropp et al. (1985) which compared the effect of ankle disk (wobble board) training and the use of orthoses among senior football players. Both interventions (orthoses and ankle disk training) were observed to have lead to a significant reduction in the frequency of ankle sprains among soccer players with previous ankle problems when compared to those without a previous history of ankle injury. The authors thus recommended the use of orthoses during the rehabilitation period and also emphasized that ankle disk training should be the method of choice in players with previous problems to prevent functional instability and recurrent ankle sprains.

Similar results to the two studies above (Surve et al., 1994; Tropp et al., 1985) were found in the study done by Sharpe, Knapik and Jones (1997) which examined the effectiveness of ankle bracing and taping in preventing recurrences of ankle sprains in female soccer players. The authors concluded that prophylactic ankle bracing was effective in reducing the incidence of ankle sprains in female soccer players with a previous history of ankle sprains.

Other studies concentrated their efforts on the reduction of the incidence of severe knee joint injuries. A study assessed the effect of a proprioceptive training program using the wobble boards on the incidence of anterior cruciate ligament (ACL) injury in 40 semi-professional and amateur soccer teams (Caraffa et al., 1996). The incidence of ACL injuries among teams following the program was significantly lower compared to the control teams after the three season observation period.

In a similar manner, a large study (Mendelbaum et al., 2005) was conducted among female youth soccer players (14-18 years old) in which neuromuscular and proprioceptive techniques, with a focus on education, soft landing, stretching, strengthening, plyometrics, and sports-specific agility drills were utilized and designed to replace the traditional warm-up. An 88% decrease in ACL injuries was observed in the first year of the study and a further 74% decrease was observed in the second year.

Hewett et al. (1999) also conducted a study in three disciplines among female players (soccer, volleyball and basketball) to investigate the effects of a 6-week neuromuscular programme on the incidence of knee injuries and obtained similar results with the studies (Mendelbaum et al., 2005; Caraffa et al., 1996) above. Additionally, instructional video and training manual demonstrating the training programme that incorporated flexibility, plyometrics and weight training to increase muscular strength and decrease landing forces were issued to coaches. The incidence of serious knee injuries over the whole season was lower in the trained group than in the control group. This study demonstrated that extensive neuromuscular training programs including flexibility, strength, landing skills and plyometrics could be effective in reducing injury in adolescent basketball, soccer, and volleyball.

However, the results of the study conducted by Soderman et al. (2000) showed that balance board (wobble board) training could not prevent severe knee injuries in female soccer players. Players in the intervention group were given a balance board and a printed handout describing the programme and were instructed to perform the exercises at home in addition to their standard training. Comparison of the intervention and control groups showed no significant differences with respect to the incidence of severe traumatic injuries of knee injuries or ankle sprain.



A recently published study by Arnason et al. (2008), examines the effect of eccentric strength training and flexibility training on the incidence of hamstring strains in soccer. The intervention consisted of warm-up stretching, flexibility and/or eccentric strength training. The study observed that warm-up stretching combined with eccentric strength training reduced the incidence hamstring strain while flexibility training alone did not have any preventive effect. Furthermore there was no significant difference in the incidence of hamstring strains between the teams that used flexibility training alone and all the teams the previous year or between the two seasons for the intervention group only.

Elias, Roberts & Thorson (1991) conducted a study aimed at addressing the contribution of an environmental factor related to weather. In the study, the effect of emergency preventive measures on heat exhaustion during a youth soccer tournament was assessed. Staff, coaches, officials and referees were provided heat stroke prevention information as well as emergency measures with game modifications and hydration techniques. It was observed that the rate of heat exhaustion per 1,000 player hours decreased after the implementation of the emergency measures from 21 cases in the first two days to 13 cases in the last four days.

Another study used a video-awareness programme as an intervention (Arnason, Engebretsen, & Bahr, 2005). This programme consisted of information about risk factors, typical injuries, and their mechanisms. Male elite soccer players viewed 12 video sequences of common injury incidents showing the entire play situation leading up to the incident. No difference was observed in injury incidence between the intervention and the control groups, nor in injury location or type.

A number of methods have been used to minimise the risk of injuries. Johnson, Ekengren, and Andersen (2005) used a cognitive-behavioural approach. This study was conducted

among identified male and female players having high injury-risk profile. The intervention programme consisted of six mental skills such as somatic and cognitive relaxation, stress management, goal setting skills, attribution and self-confidence training, and identification and discussion around critical incidents. Players in the intervention group sustained significantly lower number of injuries compared to the control group.

In a study conducted by Ekstrand, Gillquist, and Liljedahl (1983), a multi-component programme to reduce the risk of injuries was assessed. The researchers assessed the level of injury risk reduction after introducing strategies such as correction of training; provision of shin guards and special training shoes during winter; prophylactic ankle taping in players with clinical instability or history of previous strain; controlled rehabilitation; exclusion of players with serious knee instability; information about the importance of disciplined play and the increased risk of injury at training camps; and correction and supervision of doctors and physiotherapists. After a 6-month follow-up period, the players in the intervention group sustained 75% fewer injuries than those in the control teams.

Another multi-component study was conducted by Junge et al. (2002) in which the effect of education and supervision of players and coaches on the incidence of soccer injuries in male youth teams was observed. Seven teams in the intervention group followed a prevention programme consisting of strategies such as appropriate warm-up, taping of unstable ankles, adequate rehabilitation and promotion of the spirit of fair play as well as exercises to improve the stability of ankle and knee joints, the flexibility and power of the trunk, hip and leg muscles, coordination, reaction time and endurance. In addition, the coaches of the intervention teams were educated and supervised through courses, practical demonstrations and individual consultations given by a sports scientist. The results of this study show that the intervention teams sustained 21% fewer injuries compared to the control group. Furthermore,

there were observed a significant reduction of mild overuse injuries and injuries occurring during training. This study was done by the F-MARC in conjunction with a group of international experts with the purpose of testing the “The 11” programme that they developed. “The 11” consists of preventive programme that comprises ten evidence-based or best-practice exercises and the promotion of Fair Play. The 10 time-efficient exercises require no equipment other than a ball and focus on core stabilisation, eccentric training of thigh muscles, proprioceptive training, dynamic stabilisation and plyometrics with straight leg alignment. The programme is efficient as most of the exercises simultaneously train different aspects and can replace other exercises. This incorporation of the 10 exercises and the promotion of fair play resulted in the reduction of injuries (Junge et al., 2002).

In summary, there is some good evidence of the effect of external ankle support in the form of semi-rigid orthoses and proprioceptive training in the prevention of ankle sprains in soccer, especially in athletes with previous ankle sprains. Therefore, players with a history of previous sprains should be advised that wearing such supports reduces the risk of incurring a future sprain. However, little scientific evidence exists on how to prevent ankle injuries in soccer for players without a history of ankle sprain. Even if one study showed no benefits from balance board training, neuromuscular and proprioceptive training has been found to reduce the rate of severe knee injuries, including ACL injuries, in most studies. Studies based on education only were not found effective to minimise the rates of injuries but were found effective when combined with other methods. Strength training exercises have been shown to be effective in some studies as well as psychosocial and environmental interventions. Due to the fact that exercise-related injury is a complex phenomenon with a variety of physiological, psychological, and environmental factors. It has been found that multi-component intervention programmes can be effective in the reduction of the number of injuries in football mainly using “The 11”.

Various studies were found with limitations related to the small number of players selected in the sample, injury diagnosis and reporting system, lack of proper exposure and report of drop outs and finally lack of randomisation. Hence, there is still a need for more well organised prospective studies generally using “The 11” programme as well as, where possible, well-sized randomised controlled trials.

## **2.5 ROLE PLAYERS AND RESPONSIBILITY IN INJURY PREVENTION**

Individual player factors are often related to soccer injuries and can be prevented through corrections in training and conditioning (Larson et al., 1996). In their assessment of etiological factors in soccer, Ekstrand et al. (1983) found that 42% of all injuries were due to player factors such as joint instability, muscle tightness, inadequate rehabilitation or lack of training. Bergeron and Greene (1989) suggested that prevention measures are only effective when the athletes realize it to be part of the sport and that it requires their involvement. Athletes play an essential role in working with other stakeholders to maximize injury prevention. Soccer players are responsible for a number of issues to minimize the risk for injuries such as the maintenance a high level of fitness, playing within the rules of the sport, wearing safety equipments at all time during activities and seek immediate health care and following medical advice in case of injury. Bergeron and Greene (1989) concluded that if players understand and practice safety and preventive measures, the number of injuries would be reduced.

Anderson et al. (2000) stated that coaches do not typically have the background in human anatomy and physiology, health and nutrition, injury prevention, assessment, management and rehabilitation or first aid and emergency care. Therefore, coaches should be updated in this area mainly on cardiopulmonary resuscitation and emergency first aid. Coaches should recognize their contribution to the health, safety and success of the athlete (Sharkey &

Gaskill, 2006). The coach occupies a critical position in the organizational structure of preventive effort. As a supervisor of the athlete in practice and competition, the coach must recognize potentially risky situations and either avoid them or develop strategies to minimize their danger (Weaver et al., 1996). This would be achieved by properly supervising the conditioning programme and planning the activities so as not to predispose the players to excessive fatigue or injury. In addition, coaches should inform players of the risk of injuries as well as the modalities for prevention and first aid. Furthermore, the coach must ensure that sports equipment, especially protective equipments are of the highest quality, properly fitted and maintained (Arnheim & Prentice, 1993).

According to Tippet (1990), the team therapist's role in injury prevention includes the provision of education to the athletes and coaches about the risks, precautions, prevention, treatment and rehabilitation. Education should be provided to all club stakeholders on the strategies required to prevent injury, achieve peak performance, healthy playing careers and lifestyles. In addition, education on the safety and emergency policies and procedures, health care insurance coverage, review of medical forms, policies and procedures to ensure compliance are the duties of the team medical personnel. The role of medical practitioners in injury prevention is paramount and should perform a range of activities such as the examination and review of preseason physical examinations and conditioning programmes, the provision of first aid, diagnosis, treatment, rehabilitation and return to play. The team therapist should be present at training and competition, however, financial constraints may prevent the clubs to hire a full-time team therapist thus a number of them act as volunteers.

Soccer clubs are primarily responsible for implementing policies that have been developed by the governing bodies (Donaldson & Hill, 2002). Therefore, the club leader's responsibility encompasses the development, implementation and monitoring of comprehensive sport safety

plan based on local and international safety policies. All the club stakeholders should be informed of these policies. Club leaders should ensure that the playing surfaces, facilities and equipments are safe for use at training and competition. Teams should elect a safety officer or committee to develop, implement and monitor a comprehensive sports safety plan and reserve a budget for that committee. The safety officer or committee should ensure that the safety issues are addressed well at both training and competition.

## **2.6 FACTORS INFLUENCING IMPLEMENTATION OF INJURY PREVENTION**

Few studies have been done in the domain of safety policies in the clubs (Donaldson & Hill, 2002; Casey et al., 2004). In a study conducted by Casey et al. (2004) to investigate the factors that influence sport safety policies and practice, lack of qualified personnel (referees, trainers and medical support) was observed to have led to insufficiencies that resulted in the rules of the game not always being enforced and some players not receiving adequate treatment. In addition, participants in the study suggested that financial constraints led to their inability to employ qualified trainers or provide adequate club facilities. They also complained of shortage of volunteers, which led to a situation whereby the available staff were unable to adequately render services necessary for the prevention of injury.

Some of the reasons highlighted in an earlier work by Hawkins and Fuller (1998a) in which soccer player suggested they were not following some of the preventive measures due to fatigue, lack of guidance, lack of time and advice. Players reported that they did not think it was necessary and nobody else performed some of the prevention strategies like wearing shin guards during training. Hawkins and Fuller's (1998a) study was the only one which investigated the implementation of injury prevention strategies found in the literature. Therefore, this study will complement the existing knowledge regarding the implementation of injury prevention strategies in African context.

However, the study conducted by Arnason et al. (2005) did not find any difference in injury incidence after the introduction of a video-awareness programme. Another study conducted by Goodman, Bradley, Paras, Williamson and Bizzochi (2006) found out that video gaming promoted the acquisition of knowledge among young hockey players about concussion.

In addition, the results of a study conducted among college football players indicates that coaches were the most important source of information followed by teammates, magazines, books, television, internet and finally the doctor (Sefton, 2003).

## **2.7 HEALTH PROMOTION**

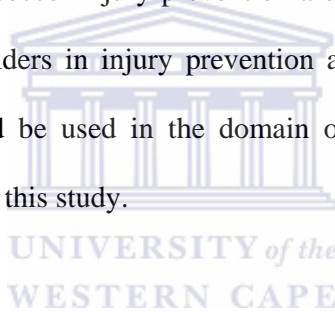
Health promotion is the process of enabling people to increase control over, and to improve, their health (WHO, 2005). Health education programmes help participants to prevent disease enhance health, and manage chronic illnesses, as well as help improve the well being of organizations and communities (Glanz, Marcus, & Rimer, 1990). It is important to be aware of the fact that the effectiveness of health promotion depends on the quality of planning. This implies a careful analysis of the problem, the behavior, the determinants, the intervention, the implementation and of the strength of the relationship between those five aspects.

Epidemiological studies on the etiology of sport injuries followed by research on behavioral determinants are necessary to direct the preventive actions (Damoiseaux & Kok, 1993). There are many health promotion activities ranging from education to legislation which can be undertaken and targeted at different groups in the population (Godfrey, 1997). This is in line with the five action areas of the Ottawa charter which includes: building of health public policy, creating supportive environments, strengthening community participation, developing personal skills, re-orientating health care services toward prevention of illness and promotion of health (WHO, 2005). This could be achieved by using the three basic strategies for health

promotion namely advocacy, enablement and mediation. Therefore, looking at the fact that soccer requires all the aspects of the game to be of high standard, health promotion could be one of the effective tools to use because it uses means which are beyond education.

## **2.8 SUMMARY OF THE CHAPTER**

The literature review highlights the variability in the definitions of injuries and data collection methods which limit the comparability and interpretation of published data. This chapter reviews epidemiological studies indicating the high incidence of injuries by highlighting their anatomical location, types, causes and risk factors. In this chapter the possibilities for soccer injury prevention are discussed. More importantly, literature suggests that aspects that are crucial for soccer injury prevention are multidimensional in nature. The responsibilities of club stakeholders in injury prevention are highlighted as well as health promotion principles that could be used in the domain of soccer. The next chapter will discuss the methodology used in this study.





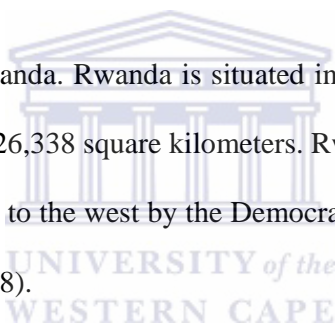
## **CHAPTER THREE: METHODOLOGY**

### **3.1. INTRODUCTION**

The aim of this study was to identify factors associated with implementation of soccer injury prevention strategies in Rwanda. This chapter explores the methods and procedures utilised in this study. Included in this chapter are descriptions of research setting, study population and sample, study design and data collection procedures. The chapter also gives details of the pilot study and how data analysis was carried out. Finally, the issues of ethical consideration relating to the study are reported.

### **3.2 RESEARCH SETTING**

The study was conducted in Rwanda. Rwanda is situated in the great lakes region in central Africa and has a surface area of 26,338 square kilometers. Rwanda is bordered to the north by Uganda, to the east by Tanzania, to the west by the Democratic Republic of Congo and to the south by Burundi (UNICEF, 1998).



### **3.3 STUDY DESIGN**

The design used in this study was a cross sectional, descriptive, quantitative study design. This was a survey involving all soccer players, coaches, medical practitioners and team leaders of the first division registered for the season 2007-2008.

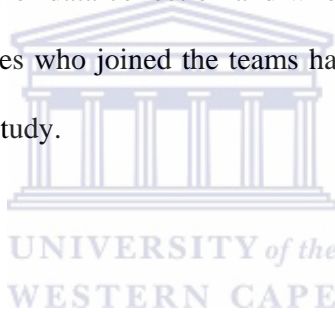
### **3.4 POPULATION AND SAMPLING**

This study was conducted in all twelve first division male soccer teams registered in FERWafa for the season 2007-2008. Teams in the second and third divisions were not registered in FERWafa by the time of data collection. All members of the above teams participated in the study. As FERWafa requires each team to register maximum 30 players,

it was anticipated that a total of number of 360 players would take part in the study. As coaches, team therapists and team leaders are members of the team and play an important role in injury prevention they were also included in this study. The total number of 12 team coaches, 12 team therapists and 12 team leaders participated in this study. It was believed that the number of the participants was too large for the study therefore there was no need for randomisation.

### **Inclusion criteria**

The inclusion criteria for players, coaches, team therapists and team leaders were all those present and part of the team and taking part in the teams' activities for the season 2007-2008 in the first division in the period of data collection and who voluntarily agreed to participate in this study. Players and coaches who joined the teams half way through the season 2007-2008 were also included in this study.



### **3.5 INSTRUMENT**

Structured self administered questionnaires with close ended questions were used. Sections regarding implementation of injury prevention strategies for soccer players (Appendix L, section B) and coaches (Appendix O, section C), sections on knowledge of injury prevention strategies of soccer players (Appendix L, section E), coaches (Appendix O, section E) and leaders (Appendix Q, section D) were used from the study done by Hawkins and Fuller (1998a). Sections on the source of knowledge of soccer players (Appendix L, section D), coaches (Appendix O, section B) and leaders (Appendix Q, section C) were used from the study conducted by Sefton (2003). Sections regarding implementation of injury prevention strategies for team leaders related to policies available in the clubs (Appendix Q, section B) and their practices for medical personnel (Appendix S, section B) were used from the study done by Donaldson and Hill (2002). Questions which were not related to the context of the

setting were removed for example the questions pertaining to the participation of women or minors in the teams.

The tool used by Donaldson and Hill (2002) was reviewed by experts in sport safety, injury prevention, sports medicine and community sport. Its inter-rater and the test-retest reliability were established as well as face and content validity. Hawkins and Fuller's (1998b) questionnaire was discussed by physiotherapists before its use. Sefton's (2003) instrument was reviewed by experts in athletic training and neurology and was tested and retested in the pilot study. Permission to use the instruments was not required.

Four types of self-administered questionnaires designed for soccer players (Appendix L), coaches (Appendix O), team medical personnel (Appendix S) and team leaders (Appendix Q) respectively were used in data collection. Players and coaches' questionnaires were comprised of five sections: section A assessing the socio-demographic characteristics; section B assessing the implementation of preventive strategies and activities taken; section C assessing the reasons why some of the activities are not done; section D on the source of information regarding injury prevention and finally section E assessing the knowledge on the occurrence, causes, types and predisposing factors of injuries. Team leaders' questionnaire was comprised of four sections: section A assessing the socio-demographic characteristics, section B assessing the different policies in place in their clubs with regard to a range of safety issues, section C assessing the source of information regarding injury prevention and section D assessing the knowledge on the occurrence, causes, types and predisposing factors of injuries. The team medical practitioners' questionnaires were comprised of two sections: section A on demographic characteristics and section B identifying the actual safety practices in place at their clubs.

## **Translations**

According to Raymond (2005) there are three official languages spoken in Rwanda; English, French and Kinyarwanda (local language). Therefore, participants were allowed to complete the questionnaire in English, French or Kinyarwanda. The questionnaires originally written in English were translated by professional linguists into French and Kinyarwanda. The validity of the tools was maintained by retranslation of the questionnaires into English from both languages by different linguists. The players' questionnaire was translated into the three languages while the team coaches, therapists and leader's questionnaires were into English and French. The rationale was that they were supposed to have an understanding of either English or French as the main academic languages in Rwanda.

## **3.6 PILOT STUDY**

A pilot study was carried out to test the instrument. Questionnaires were tested on three teams in the second division. Twenty players in each team, three team coaches, three team therapists and three team leaders participated in the pilot study and completed the questionnaires in the three languages. According to De Vos, Strydom, Fouché, and Delpont, (2002), a pilot study offers the researcher the opportunity of testing the effectiveness of the questionnaires. The changes which were noted helped to design a more appropriate instrument that was well understood by the participants. The major changes were on the section assessing the sources of knowledge in which participants were requested to rank the source of information (coach/trainer, teammates, doctors, TV, magazines, books) in order of importance from 1-8 with 1 being the most important and 8 being the least important. Participants in this section were therefore requested to rank the sources of information, combined into doctors/physiotherapists, coaches, media and seminars, from most important to least important. Minor modifications were made to a small number of questions to improve the clarity of their wordings.

### **3.7 VALIDITY**

Validity determines the extent to which an instrument measures what it is supposed to measure (Sarantakos, 2000). The validity of the original questionnaires was ensured in previous studies. To maintain validity of the instruments, they were sent to expert in the field of sport medicine for review. Additionally, they were reviewed by experienced coaches working as technical advisors in FERWafa. Discussions were held with coaches, team therapists, team leaders and selected players who participated in the pilot study. Few changes were made accordingly in the questionnaires concerning their quality, clarity and understanding.

### **3.9 RELIABILITY**

Reliability is referred to as the ability of the instrument to produce consistent results when the measurement is repeated at more than one occasion (Sarantakos, 2005). The instruments were adapted from ones which their validity and reliability have been established. The adapted questionnaires were tested and retested during the pilot study. The retest was done after one week and comparison was made between the two measurements. There were high similarities between the two sets of data collected. Therefore, the results of the data extracted ascertained that the instrument was reliable for the exercise.

### **3.10 PROCEDURE**

#### **3.10.1 Training of assistants**

Data collection required research assistants. The researcher needed intervention of two physiotherapists who assisted him during the data collection period. Two physiotherapists were provided a two day training programme. The purpose of the training was to explain to them the study in general, the aim of the study as well as all ethical considerations. They were provided with a detailed explanation of the data collection procedures and their role in

the study. After the pilot studies, the researcher held a meeting with the assistants to discuss the difficulties encountered and the way forward.

### **3.10.2 Data collection**

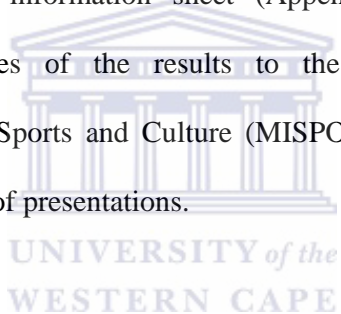
After obtaining ethical clearance from the University of the Western Cape (20 November, 2007) and permission from relevant authorities in Rwanda (31 December, 2007) participants were found in their respective teams. Team managers and technical directors were met mostly for introduction and appointment. The researcher introduced himself and the research assistants and explained what the study was all about to give the managers the idea of the study using the participants information sheet (Appendix F, G, H). The objectives of the study as well as all ethical issues were explained to them. Once agreed, appointments were made often after consulting the coach in order to avoid any interference with their training sessions. Despite the fact that the participants information sheet of each questionnaire requested the respondents to participate in the study, verbal explanations were provided either in a group or individually to obtain consent. Most of the questionnaires were administered during the free time of the participants in training camps. This was similar for coaches and team medical personnel. Questionnaires were distributed and collected the same day to ensure maximum response rate. Some teams were visited two to three times at their training fields. Team managers were given one week to fill the questionnaires. The questionnaires were administered and collected by the researcher and his assistants.

### **3.11 DATA ANALYSIS**

The statistical package for social science (SPSS) version 16.0 and Microsoft excel were used to analyse data. Descriptive statistics were conducted to obtain a profile of the study population. Descriptive data are presented in chapter four in tables and figures.

### **3.12 ETHICAL CONSIDERATIONS**

After obtaining permission from the Higher Degrees Committee, and the Research and Study Grant Committee at University of the Western Cape for ethical permission (APPENDIX A), the researcher requested permission to conduct the study from the Republic of Rwanda through the Ministry of Youth and Sports (APPENDIX B) and the Rwanda Football Federation (APPENDIX C). In addition, written consent was sought from all participants after explaining to them the aim and objectives of the study. Participants were informed that participation was voluntary. The participants were assured of the anonymity and that their information would be handled with confidentiality. All participants were assured of their right to withdraw from the study at any time without any impact. All this information was given using the participants' information sheet (Appendix F). The researcher made commitment to provide copies of the results to the Rwanda Football Federation (FERWAF), the Ministry of Sports and Culture (MISPOC) as well as to all the soccer community members by means of presentations.



### **3.13 SUMMARY OF THE CHAPTER**

The chapter described the research setting in which the study was based; it also explained the methods used to collect data. The study design, study population, sampling method and instruments were described. The pilot study, the data collection procedure and analysis process were also explained. Finally, the chapter explained how the ethical considerations were applied in this study. The next chapter will present the results of the study.

## **CHAPTER FOUR: RESULTS**

### **4.1. INTRODUCTION**

This chapter presents the results of this study. The demographics of all the respondents are presented in one section including age, experience and playing position for the players, the post (position) in the team for team leaders and academic qualification for medical practitioners. The results are presented under different headings reflecting the general knowledge and the implementation of injury prevention strategies. The source of knowledge and factors influencing the implementation of injury prevention strategies are also presented.

### **4.2. DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS**

All the subjects that were present at the time of data collection, met the inclusion criteria and consented were participated in this study. Therefore 313 soccer players participated in this study and the number of players per team ranged from 24 to 29. Ten coaches, nine team leaders and eleven team medical personnel participated in this study. A 100% participation was not achieved due to the fact that a) December 2007-January 2008 was the time for data collection which coincides with the period for team preparation for the teams, b) some teams were still in the process of recruiting the players to achieve the required number of 30 players per team, c) some players were on leave for the Christmas and New Year holidays, d) some players were not available as they were representing the country in the CECAFA senior challenge cup which takes place during the period.



#### 4.2.1. Characteristics of soccer players

The youngest player in the leagues was 17 years while the oldest was 32 years. The average age of the players was 22.15 (Standard Deviation, SD=2.5) years, with the majority (70 %) in the 20-24 age group. The average number of years each player spent in the lower division (before playing in the first division) was 2.49 (SD=1.24) years. The average number of years each player has spent in the first division was 3.17 (SD=1.92) years, while the average number of years spent in the current team was 2.19 (SD=1.12) years. The position represented within the teams is as follows, midfielders 33.5% (n=105) defenders 32.6% (n=102) and strikers 23.0% (n=72). There were only 10.9% (n=34) goalkeepers (Table 4.1).

**Table 4.1: Demographic characteristics for soccer players (N=313)**

Variables	Characteristics	Frequency	%
Age group	15-19	25	8.0
	20-24	247	78.9
	25-29	34	10.9
	30-34	7	2.2
Position in the team	Goal keeper	34	10.9
	Defender	102	32.6
	Midfielder	105	33.5
	Striker	72	23.0
Number of years in the first division	1-4	250	79.9
	5-8	59	18.8
	9-12	4	1.3
Number of years before first division	1-2	182	58.1
	3-4	114	36.4
	5-6	13	4.2
	7-8	4	1.3
Number of years in the current team	1-2	215	68.7
	3-4	88	28.1
	5-6	9	2.9
	7-8	1	0.3

#### 4.2.2. Characteristics of coaches

The average age of the team coaches was 41.5 (SD=5.72) years. The average number of years spent coaching a team in the first division was 4.3 (SD=2.00) years. In terms of total years of experience, team coaches had spent an average of 6.7 (SD=1.89) years in coaching and an average of 1.8 (SD=0.92) years in their current teams. Table 4.2 below illustrates the demographic characteristics of the coaches.

**Table 4.2: Demographic characteristics for team coaches (N=10)**

Variables	Characteristics	Frequency	%
Age group	30-39	5	50
	40-49	4	40
	50-59	1	10
Number of years in coaching	1-4	2	20
	5-8	6	60
	9-12	2	20
Number of years in the first division	1-4	7	70
	5-8	2	20
	9-12	1	10
Number of years in current team	1	5	50
	2	2	20
	3	3	30

#### 4.2.3. Characteristics of team leaders

Most of the team leaders had spent an average of 4.89 (SD=4.91) years in the management of a club; and 3.89 (SD=3.92) years in the management of their current clubs. On average, they have been involved in soccer 9.78 (SD=6.78) years prior to the study. Table 4.3 below shows that the president and the treasurer represented 77.7% (n=7) of the team leaders in the clubs assessed in the survey. The remaining teams were represented by a team manager and a secretary.

**Table 4.3: Demographic characteristics for team leaders (N=9)**

Variables	Characteristics	Frequency	%
Position in the club	President	4	44.4
	Secretary	1	11.1
	Treasurer	3	33.3
	Team manager	1	11.1
Number of years in the management of the club	1-5	6	66.7
	6-10	1	11.1
	11-15	2	22.2
Number of years in the management of your club	1-5	6	66.7
	6-10	2	22.2
	11-15	1	11.1
Number of years in the soccer in general	1-5	3	33.3
	6-10	2	22.2
	11-15	2	22.2
	16-20	1	11.1
	21-25	1	11.1

#### 4.2.4. Characteristics of team medical personnel

Table 4.4 shows that the majority of team medical personnel were nurses (63.6%) followed by physiotherapists (18.2%) and finally a medical doctor (9.1%) and a dentist (9.1%). The medical personnel were found to have an average of 9.27 (SD=5.75) years of experience in their respective qualifications with 6.91 (SD=4.66) years of experience in soccer and 5.18 (SD=3.31) years in their clubs.

**Table 4.4: Demographic characteristics for team medical personnel (N=11)**

Variables	Characteristics	Frequency	%
Qualification	Medical Doctor	1	9.1
	Nurse	7	63.6
	Physiotherapist	2	18.2
	Others	1	9.1
Number of years in the current club	1-5	6	54.5
	6-10	4	36.4
	11-15	1	9.1
Number of years in the qualification	1-5	3	27.2
	6-10	4	36.4
	11-15	2	18.2
	16-20	2	18.2
Number of years of experience in soccer	1-5	4	36.4
	6-10	5	45.4
	11-15	1	9.1
	16-20	1	9.1

### 4.3. GENERAL KNOWLEDGE OF THE PARTICIPANTS ABOUT SOCCER INJURY PREVENTION

The knowledge on soccer injury prevention was assessed for soccer players, coaches and team leaders. They were asked 11 questions which were grouped into three categories. Three questions were grouped under the occurrence of injuries, two questions under the causes and risk factors and six under injury prevention strategies. They were given a set of sentences where they had a choice of responses to each one from strongly agree to strongly disagree.

#### 4.3.1. Knowledge on the occurrence of injuries

Table 4.5 indicates that all the players (100%), all the coaches (100%) and almost all the leaders (88.9%) had the same positive views as to the likelihood of sustaining an injury during training or match that prevents the player from being available for selection. This was similar to their view as to the occurrence of injuries during a competitive match than during training.

**Table 4.5: Knowledge of the participants on the occurrence of injuries (soccer players: N=313; Coaches: N=10; Leaders: N= 9)**

	Characteristics	Players n (%)	Coaches n (%)	Leaders n (%)
The chance of sustaining an injury during training that prevents the player from being available for selection is likely to happen.	Strongly agree	130 (41.5)	3 (30.0)	3 (33.3)
	Agree	183 (58.5)	7 (70.0)	5 (55.6)
	Neither agree nor disagree	0 (0.0)	0 (00.0)	0 (0.0)
	Disagree	0 (0.0)	0 (00.0)	1 (11.1)
	Strongly disagree	0 (0.0)	0 (00.0)	0 (0.0)
The chance of sustaining an injury during a competitive match that prevents the player from being available for selection is likely to happen.	Strongly agree	215 (68.7)	2 (20.0)	4 (44.4)
	Agree	98 (31.3)	8 (80.0)	5 (55.6)
	Neither agree nor disagree	0 (0.0)	0 (00.0)	0 (0.0)
	Disagree	0 (0.0)	0 (00.0)	0 (0.0)
	Strongly disagree	0 (0.0)	0 (00.0)	0 (0.0)
There is a greater chance of sustaining an injury during a competitive match than during training.	Strongly agree	165 (52.7)	2 (20.0)	6 (66.7)
	Agree	148 (47.3)	7 (70.0)	3 (33.3)
	Neither agree nor disagree	0 (0.0)	1 (10.0)	0 (0.0)
	Disagree	0 (0.0)	0 (00.0)	0 (0.0)
	Strongly disagree	0 (0.0)	0 (00.0)	0 (0.0)

### 4.3.2. Knowledge on the causes and risk factors

Table 4.6 shows that 228 players (72.8%) disagreed or strongly disagreed about the statement indicating that “injuries are the consequences of the action of another player” whereas five coaches (50%) and five leaders (55.6%) agreed or strongly agreed. Similar results were observed as to the likelihood of injury towards the end of the match.

**Table 4.6: Knowledge of the participants as to the causes and risk factors (soccer players: N=313; Coaches: N=10; Leaders: N= 9)**

Characteristics		Players n (%)	Coaches n (%)	Leaders n %
Injuries are the consequence of the action of another player.	Strongly agree	18 (5.8)	1 (10.0)	1 (11.1)
	Agree	45 (14.4)	4 (40.0)	4 (44.5)
	Neither agree nor disagree	22 (7.0)	3 (30.0)	1 (11.1)
	Disagree	110 (35.1)	1 (10.0)	3 (33.3)
	Strongly disagree	118 (37.7)	1 (10.0)	0 (0.0)
Injury is more likely towards the end of the match.	Strongly agree	25 (8.0)	1 (10.0)	0 (0.0)
	Agree	61 (19.5)	4 (40.0)	5 (55.6)
	Neither agree nor disagree	38 (12.1)	4 (40.0)	1 (11.1)
	Disagree	98 (31.3)	1 (10.0)	3 (33.3)
	Strongly disagree	91 (29.1)	0 (0.0)	0 (0.0)

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### 4.3.3. Knowledge on different injury prevention strategies

Table 4.7 shows that almost all the players, coaches and team leaders shared the same views as to the reduction of the risk of injuries by wearing shin guards, warming up and stretching prior to training or competition and the role of flexibility and strength in injury risk reduction.

**Table 4.7: Knowledge of the participants on different injury prevention strategies (soccer players: N=313; Coaches: N=10; Leaders: N= 9)**

	Characteristics	Players N (%)	Coaches N (%)	Leaders N (%)
The risk of lower leg injuries in training is reduced by wearing shin guards.	Strongly agree	134 (42.8)	2 (20.0)	3 (33.3)
	Agree	179 (57.2)	8 (80.0)	6 (66.7)
	Neither agree nor disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Strongly disagree	0 (0.0)	0 (0.0)	0 (0.0)
The risk of injury is reduced by thoroughly warming up and stretching prior to training or competition.	Strongly agree	137 (43.8)	0 (0.0)	3 (33.3)
	Agree	155 (49.5)	10 (10.0)	6 (66.7)
	Neither agree nor disagree	21 (6.7)	0 (0.0)	0 (0.0)
	Disagree	0 (0.0)	0 (0.0)	0 (0.0)
	Strongly disagree	0 (0.0)	0 (0.0)	0 (0.0)
The risk of injury is reduced by thoroughly cooling down and stretching prior to training or competition.	Strongly agree	58 (18.5)	1 (10.0)	0 (0.0)
	Agree	80 (25.6)	9 (90.0)	7 (77.8)
	Neither agree nor disagree	29 (9.3)	0 (0.0)	1 (11.1)
	Disagree	77 (24.6)	0 (0.0)	1 (11.1)
	Strongly disagree	69 (22.0)	0 (0.0)	0 (0.0)
Players with poor flexibility are more likely to get injured than those with good flexibility.	Strongly agree	102 (32.6)	0 (0.0)	2 (22.2)
	Agree	134 (42.8)	8 (80.0)	7 (77.8)
	Neither agree nor disagree	25 (8.0)	2 (20.0)	0 (0.0)
	Disagree	36 (11.5)	0 (0.0)	0 (0.0)
	Strongly disagree	16 (5.1)	0 (0.0)	0 (0.0)
Strong muscles are important in the protection against injury	Strongly agree	81 (25.9)	0 (0.0)	2 (22.2)
	Agree	100 (31.9)	9 (90.0)	6 (66.7)
	Neither agree nor disagree	27 (8.6)	1 (10.0)	1 (11.1)
	Disagree	73 (23.3)	0 (0.0)	0 (0.0)
	Strongly disagree	32 (10.2)	0 (0.0)	0 (0.0)
The majority of the players wear shin guards during training.	Strongly agree	0 (0.0)	0 (0.0)	1 (11.1)
	Agree	0 (0.0)	0 (0.0)	2 (22.2)
	Neither agree nor disagree	7 (2.2)	2 (20.0)	3 (33.3)
	Disagree	160 (51.1)	7 (70.0)	3 (33.3)
	Strongly disagree	146 (46.6)	1 (10.0)	0 (0.0)

#### 4.4 IMPLEMENTATION OF SOCCER INJURY PREVENTION STRATEGIES

Implementation of injury prevention strategies is presented according to each group of participants (soccer players, team coaches, team leaders, team medical practitioners).

#### 4.4.1 Implementation of injury prevention strategies for soccer players

##### 4.4.1.1 Use of protective equipments

All the players (100%) reported that they always wore appropriate footwear but never used mouth guards as well as head gears. All the 34 goalkeepers indicated that they always used gloves either in training sessions or in competition.

##### *Wearing shin guards*

Almost all players (98.4%) never used shin guards without ankle protection during training while 3 (1.0%) used them always. When it comes to competition, this number drops to 74.8% and an increase in number of those wearing them always (16.6%). Concerning wearing shin guards with ankle protection, 310 (99.0%) players do not use them during training sessions whereas 235 (75.1%) players use them always during competition.

**Table 4.8: The use of shin guards (N=313)**

	Wearing shin guards							
	With ankle protection				Without ankle protection			
	Training		Competition		Training		Competition	
	n	%	n	%	n	%	n	%
Always	3	1.0	52	16.6	2	0.6	235	75.1
Very often	1	0.3	12	3.8	1	0.1	8	2.6
Often	1	0.3	11	3.5	0	0.0	10	3.2
Sometimes	0	0.0	4	1.3	0	0.0	13	4.2
Never	308	98.4	234	74.8	310	99.0	47	15.0

##### *Wearing ankle protection*

Table 4.9 indicates that 54 players (17.3%) always use ankle protective equipments during training but this number increases to 91 while in competition (29.1%).

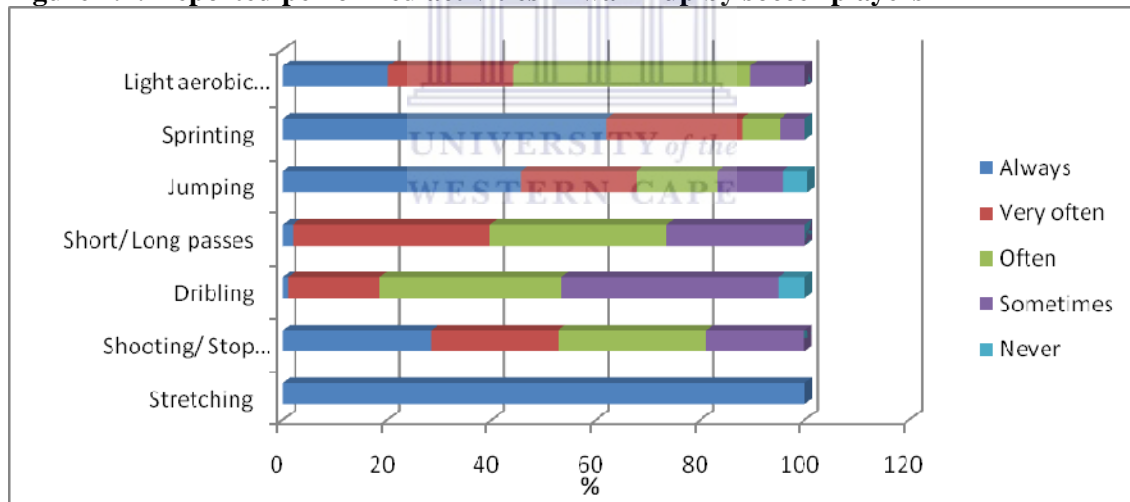
**Table 4.9: The use of ankle protection (N=313)**

	Training		Competition	
	Frequency	%	Frequency	%
Always	54	17.3	91	29.1
Very often	33	10.5	44	14.1
Often	76	24.3	48	15.3
Sometimes	18	5.8	23	7.3
Never	132	42.2	107	34.2

#### 4.4.1.2. Warming up

The results of this study indicate that all the players (100%) reported that they always performed warm up either before training or competition. Players were further asked to mention the activities that they include in warm up such as light aerobic activities, sprinting, dribbling, jumping, short and long passes, shooting and stop shoots for goalkeepers and stretching. Stretching was the activity that was always included in warm up by all the players (100%). Other activities like light aerobic activities were not frequently included in warm up with more than half often (45.4%) or sometimes (10.5%) including them. A great number of players always included jumping (45.7%) and sprinting (62.0%) in warm up. Short and long passes were always included by only six (1.9%) players while three (1.0%) of them always included dribbling in warm up (Figure 4.1).

**Figure 4.1: Reported performed activities in warm up by soccer players**





### *Warm up time*

Table 4.10 indicates that 78% of the players reported warming up their bodies at least 20 minutes during competition while this percentage drops to 39% during training sessions.

**Table 4.10: Time allocated for warm up (N=313)**

	Training		Competition	
	Frequency	%	Frequency	%
5 minutes	0	0.0	0	0.0
10 minutes	52	16.6	3	1.0
15 minutes	139	44.4	66	21.1
20 minutes	96	30.7	159	50.8
25 minutes	26	8.3	85	27.2

### **4.4.1.3 Cooling down**

#### *Cool down periods*

All the players reported (100%) that they always performed cool down at the completion of training sessions however no one included it at the end of the competition.

Table 4.11 indicates that all the players (100%) always included stretching in cool down while 280 (89.5%) always included light jogging and only two (0.6%) always included light callisthenic exercises in cool down sessions.

**Table 4.11: Included activities in cool down (N=313)**

Cool down activities		Always	Very often	Often	Sometimes	Never
Light jogging	n (%)	280 (89.5)	27 (8.6)	6 (1.9)	0 (0.0)	0 (0.0)
Light calisthenics	n (%)	2 (0.6)	69 (22.0)	104(33.2)	138 (44.1)	0 (0.0)
Stretching	n (%)	313 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

#### *Cool down time*

The majority of players (n=222, 71.0%) reported to have a cool down period of five minutes while only two (0.6%) reported to have a cool down time of 15 minutes and above. Since no one had a cool down period at the completion of the competition this question was then not applicable. (Table 4.12)

**Table 3.12: Time reserved for cool down (N=313)**

	Training		Competition	
	Frequency	%	Frequency	%
5 minutes	222	71.0		
10 minutes	89	28.4		
15 minutes	2	0.6		
20 minutes	0	0.0		
25 minutes	0	0.0	Not applicable	Not applicable

#### 4.4.1.4 Stretching exercise

##### *Stretching of major leg muscles in warm up and cool down*

All the players (100%) reported that they included stretching of the major leg muscles always in warm up (prior to training or competition) and in cool down (at the completion of training) but no player (0%) performed stretching after competition. Players were further asked to report how often they emphasized on some of the actions performed during stretching, a number of 102 (32.6%) sometimes and 88 (28.1%) often made sure that their muscles were warm before stretching. Sustained stretch was found to be performed by more than half of the players (very often: 32.2%; Always: 26.8%) while 107 out of 313 players sometimes bounced in stretching (Table 4.13).

**Table 4.13: Key emphasis during stretching (N=313)**

Stretching precautions		Always	Very often	Often	Sometimes	Never
Make sure muscles are warm first	N (%)	47 (15.0)	76 (24.3)	88 (28.1)	102 (32.6)	0 (0)
Hold the stretch	N (%)	84 (26.8)	101 (32.3)	61 (19.5)	58 (18.5)	9 (2.9)
Bounce in stretch	N (%)	31 (9.9)	54 (17.3)	97 (31.0)	107 (34.2)	24 (7.7)

##### *Stretch repetition and time held in stretch*

Table 4.14 indicates that the majority of players (122 out of 313) repeated the stretch three times during a training session while the least number (15 out of 313) repeated the stretch five times. More than three quarters of the players (79.8%) reported to hold the stretch for at least 15 seconds while no one performed it either 5 or 25 seconds.

**Table 4.14: Time and repetition of stretch (N=313)**

Repetitions	Stretch repetition		Time	Time held in stretch	
	Frequency	%		Frequency	%
1	34	10.9	5 seconds	0	0.0
2	99	31.6	10 seconds	63	20.1
3	122	39.0	15 seconds	223	71.2
4	43	13.7	20 seconds	27	8.6
5	15	4.8	25 seconds	0	0.0

#### 4.4.1.5 Strength training

Two hundred players (63.9%) undertook strength training twice a week as part of the team while 30 (9.6%) did not do any strength training. Individually, 89 (28.4%) players undertook strength training twice a week, followed by those who did it thrice a week (76) 24.3% while 37 (11.8%) did not do it at all. It was further noted that the 30 players who did not perform strength training as part of the team were included among those who did not do it as extra individual work (Table 4.15).

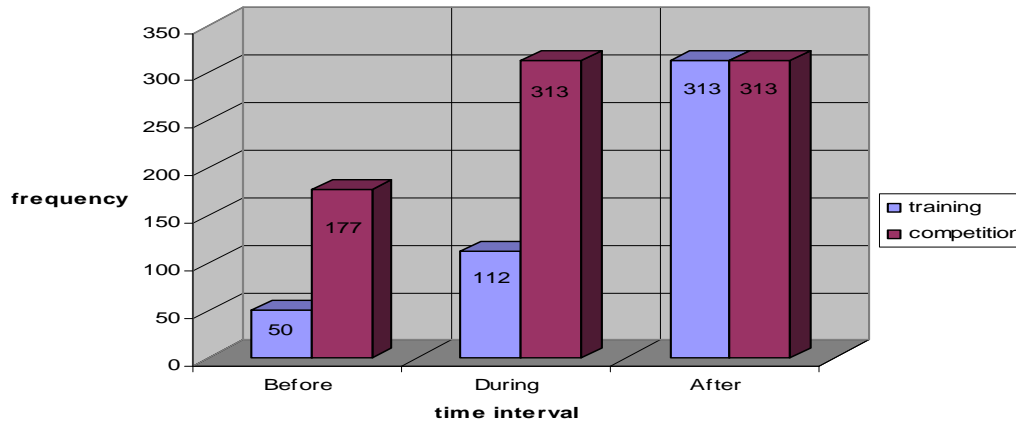
**Table 4.15: Number of strength training per week (N=313)**

Repetition	As part of the team		As extra individual work	
	Frequency	%	Frequency	%
0	30	9.6	37	11.8
1	49	15.7	52	16.6
2	200	63.9	89	28.4
3	34	10.9	76	24.3
4	0	0.0	59	18.8

#### 4.4.1.6 Water intake

All the players reported drinking water after training and competition but only 50 out of 313 (16%) drink water before training (Figure 4.2).

**Figure 4.2: Water consumption**



**4.4.1.7 Nutrition**

***Carbohydrate intake***

Many players reported that they never consume carbohydrates before the training or competition (313 players versus 247 players). Although all the players (313) reported that they always consume carbohydrates before training, the majority of them reported that they sometimes (155 players) or often (93 players) consume carbohydrates after competition (Table 4.16).

**Table 4.16: Carbohydrate consumption (N=313)**

	Carbohydrate intake							
	Before				After			
	Training		Competition		Training		Competition	
	n	%	N	%	n	%	n	%
Always	0	0.0	313	100.0	0	0.0	0	0.0
Very often	0	0.0	0	0.0	0	0.0	7	2.2
Often	0	0.0	0	0.0	5	1.6	93	29.7
Sometimes	0	0.0	0	0.0	61	19.5	155	49.5
Never	313	100.0	0	0.0	247	78.9	58	18.5

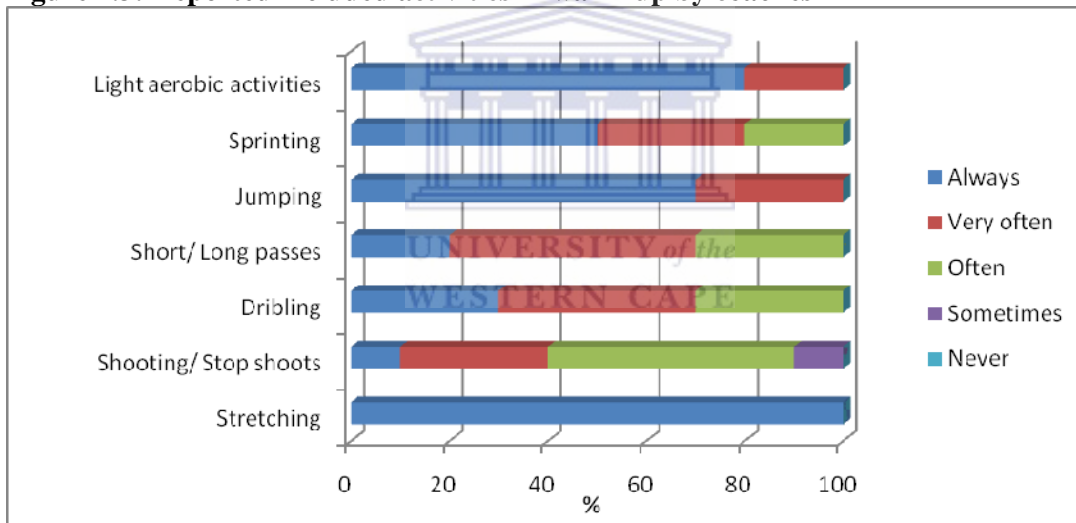
## 4.4.2 Implementation of injury prevention strategies for team coaches

### 4.4.2.1 Supervision of warm up

#### *Supervision of warm up and included activities*

All the coaches (100%) reported that they always supervised players during warm up periods prior to training and to competition. Coaches were asked to mention the activities that they include in warm up such as light aerobic activities, sprinting, dribbling, jumping, short and long passes, shooting and stop shoots for goalkeepers and stretching. Figure 4.3 shows that stretching was reported to be always included in warm up by all the coaches (100%) followed by light aerobic activities (80%) and jumping (70%). Sprinting and long and short passes were reported to be included in the warm up by half of the coaches.

**Figure 4.3: Reported included activities in warm up by coaches**



#### *Warm up time*

Table 4.17 shows that all the coaches supervised warm up at least 15 minutes prior to training sessions and prior to competition.

**Table 4.17: Warm up time (N=10)**

	Training		Competition	
	Frequency	%	Frequency	%
5 minutes	0	0.0	0	0.0
10 minutes	0	0.0	0	0.0
15 minutes	0	0.0	0	0.0
20 minutes	7	70.0	8	80.0
25 minutes	3	30.0	2	20.0

#### 4.4.2.2 Supervision of cool down

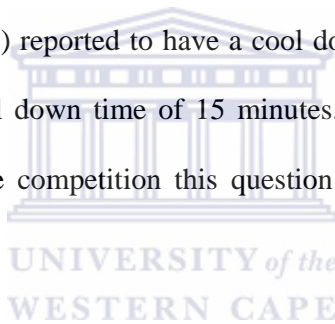
All the coaches (100%) reported that they supervised cool down sessions at the completion of the training sessions but did not do it after the competition. Table 4.18 shows that all the coaches (100%) reported that they always included stretching in cool down while only one (10.0%) reported always including light callisthenic exercises and jogging (20.0%) in cool down sessions.

**Table 4.18: Activities included in cool down (N=10)**

Cool down activities		Always	Very often	Often	Sometimes	Never
Light jogging	n (%)	2 (20)	3 (30)	4(40)	1 (10)	0 (0)
Light calisthenics	n (%)	1 (10)	1 (10)	5 (50)	3 (30)	0 (0)
Stretching	n (%)	10 (100)	0 (0)	0 (0)	0 (0)	0(0)

#### *Cool down time*

The majority of coaches (70.0%) reported to have a cool down period of five minutes while the rest reported to have a cool down time of 15 minutes. Since no one had a cool down period at the completion of the competition this question was then not applicable (Table 4.19).



**Table 4.19: Cool down time (N=10)**

	Training		Competition	
	Frequency	%		
5 minutes	7	70.0		
10 minutes	3	30.0		
15 minutes	0	0.0		
20 minutes	0	0.0		
25 minutes	0	0.0	<b>Not applicable</b>	<b>Not applicable</b>

#### *Key emphasis during training*

Coaches reported that they always (30%), very often (30%), often (30%) balanced fitness exercises and skills development exercises in their training sessions. They further reported that they always (50%) or very often (50%) gradually increased the intensity in the training sessions. Ninety percent of respondents (90%) reported that they always taught players to be aware of their training and half of them (50%) reported that they noted the changes in skills

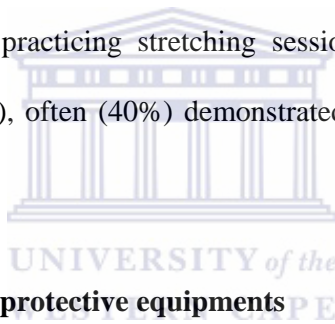
and techniques. Eight out of ten coaches (80%) reported that they were allocated three weeks to prepare players for a season while periods of four and five weeks were each reported by 10% of the coaches (Table 4.20).

**Table 4.20: Time allocated for preseason training (N=10)**

Time in weeks	Training	
	Frequency	%
2 weeks	0	0.0
3 weeks	8	80.0
4 weeks	1	10.0
5 weeks	1	10.0
6 weeks	0	0.0

#### 4.4.2.3 Supervision of stretching

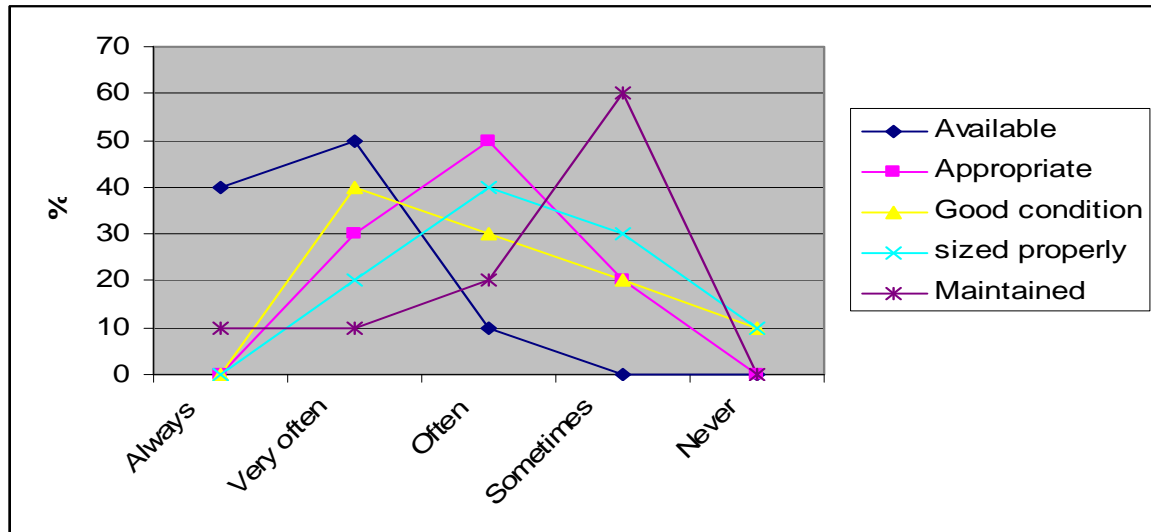
All the coaches (100%) reported that they always explained different skills and always paid attention to the players while practicing stretching sessions. Coaches reported that they always (30%), very often (30%), often (40%) demonstrated the skills to the players during stretching.



#### 4.4.2.4 Availability and use of protective equipments

Coaches reported that they always (n=4, 40.0%) or very often (n=5, 50.0%) ensured that equipments were available and used by players. Half of them (n=5, 50.0%) reported that they often ensured that equipments were appropriate. Four coaches (40.0%) often ensured that equipments were in good condition and often sized properly while five coaches (50.0%) reported that they sometimes ensured that equipments were maintained (Figure 4.4).

**Figure 4.4: Coaches' role in the use of protective equipments**



#### 4.4.3. Implementation of injury prevention strategies for team leaders

Team leaders, considered as policy makers were asked questions related to the policies available in their clubs. Table 4.21 shows the frequency of team leaders answering “Yes” to a range of questions related to the policies in place at their clubs. Five out of nine team leaders (55.6%) reported that their clubs had policy on a sport safety and risk management, they all (100%) reported having an emergency action policy in the event of severe injury and a code of conduct and/or fair play policy for players. Eight team leaders (88.9%) reported to have a code of conduct for people attending competition.

**Table 4.21: Safety policies available in teams (N=9)**

Safety policies	Frequency and % of team leaders answering Yes	
	n	%
A comprehensive policy on sport safety/risk management	5	55.6
An emergency action policy in the event of severe injury	9	100
A pre-participation health screening policy	3	33.3
A policy on alcohol or other drugs	2	22.2
A code of conduct and/or fair play policy for players	9	100
A code of conduct of people attending competition	8	88.9
Presence of formal sport insurance policy	2	22.2
Compulsory insurance at the club	1	11.1
Safety committee	2	22.2
Safety budget	0	0
Review of policies	0	0



Team leaders were asked to indicate whether policies were in place related to a range of safety issues at competition and at training (Table 4.22).

**Table 4.22: Comparison of safety policies adopted at training and competition (N=9)**

Safety issues	% of respondents answering Yes	
	Training n (%)	Competition n (%)
A policy on attendance of medical practitioners	9 (100)	9 (100)
A policy on safety inspection of playing surfaces	2 (22.2)	4 (44.4)
A policy on wearing and use of protective equipments	0	6 (66.7)

***Awareness of club stakeholders about the safety policies in place at their clubs***

Table 4.23 indicates that six team leaders (66.7%) thought that the administrators of their clubs had “medium information” about the safety policies at their club while three (33.3%) thought that the coaches at their clubs were “very well informed”. Four team leaders (44.4%) thought that the coaches had “medium information” while five (55.6%) thought that the medical personnel had “medium information” about the safety policies at their club.

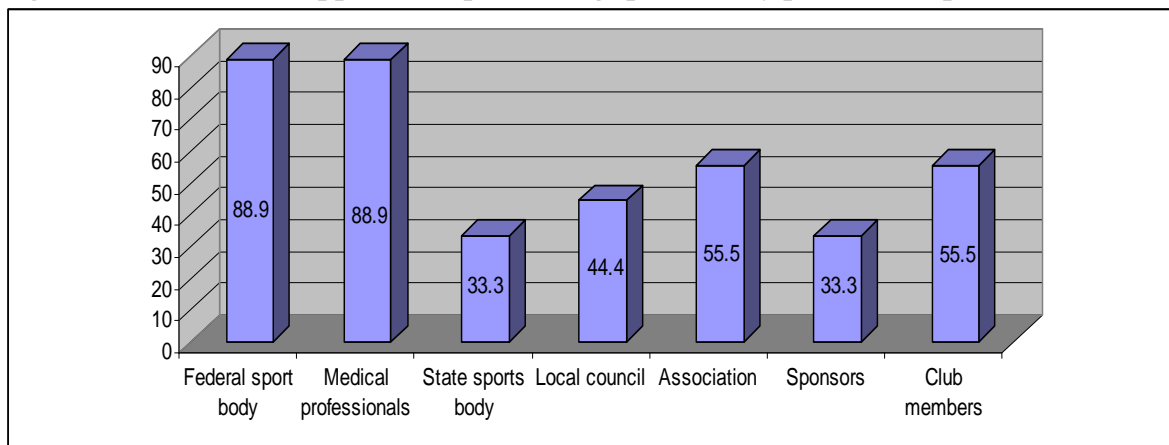
**Table 4.23: Club stakeholders’ awareness about safety policies at their clubs (N=9)**

Club stakeholders	Poor		Medium		Very good	
	N	%	n	%	n	%
Administrators	2	22.2	6	66.7	1	11.1
Coaches	2	22.2	4	44.4	3	33.3
Players	4	44.4	5	55.6	0	0.0
Medical personnel	0	0.0	5	55.6	4	44.4

***Support in implementing safety policies and practices***

All the team leaders (100%) reported that their club would like access to more safety training programmes as well as assistance to implementing a safety programme for sport. Figure 4.5 below shows that eight (88.9%) team leaders suggest that the federal sport body and medical practitioners should actively support their clubs to implement safety policies and practice. Three team leaders (33.3%) identified the state sports body and sponsors being the source of support while associations, club members and players were identified to be the sources of support by five team leaders (55.5%).

**Figure 4.5: Sources of support in implementing sports safety policies and practices**



#### **4.4.4. Implementation of injury prevention strategies for team medical personnel**

Team medical personnel were asked to report on their attendance during training and competition. Figure 4.6 shows that all of them (100%) reported that they were always present at competition but less than half of them (45.5%) reported that they were often present at training. Seven out of eleven medical personnel (63.6%) reported that appropriate first aid equipment was very often available at matches and always available at competition whereas two medical personnel (18.2%) reported that a telephone was always available in the case of emergency at training while the majority of them (63.6%) reported that a telephone was always available at competition. The majority of medical personnel (63.6%) reported that their clubs always or very often ensured access for ambulance and emergency service vehicles to the facilities during training while almost all the respondents (90.9%) reported that their clubs always or very often ensured access for ambulance and emergency service vehicles to the facilities during competition. Six medical personnel (54.5%) reported that fixtures and fittings—goal posts, corner flags etc.—within playing field were sometimes or never made safe at training while seven (63.6%) reported that fixtures and fittings were always or very often made safe at competition. Six team medical personnel (54.5%) reported that the playing surfaces used by their clubs were sometimes in safe condition while the rest

reported that playing surfaces used by their clubs were very often (n=2, 18.2%) or often (n=3, 27.3%) in safe condition.

**Figure 4.6: Safety practices in place implemented by medical practitioners (N=11)**

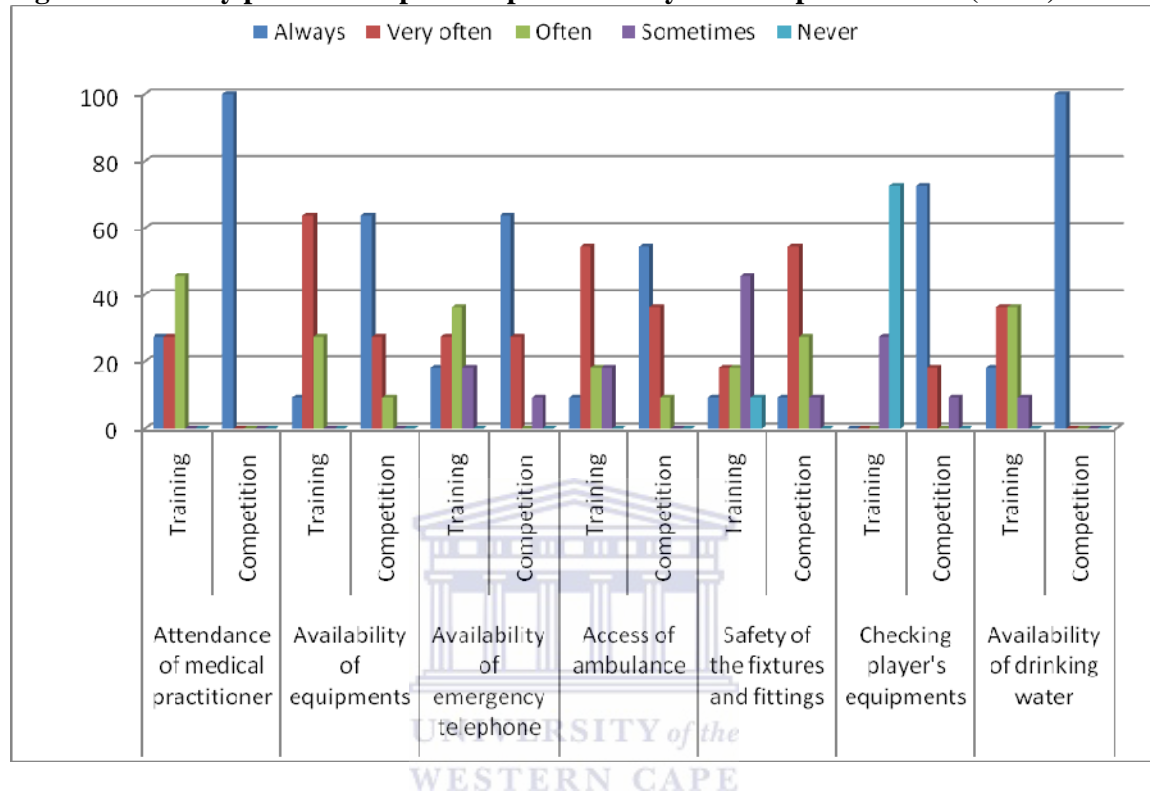


Table 4.24 indicates that medical personnel encouraged players to drink more frequently, stretch and cool down with emphasis during competition than training. On the contrary, they encouraged players to warm up more in training than in competition.

**Table 4.24: Duties of the medical personnel (N=11)**

	Training n (%)	Competition n (%)
Encouragement of players to drink more frequently	7 (63.6)	11 (100)
Encouragement of players to warm up	8 (72.7)	3 (27.3)
Encouragement of players to cool down	5 (45.5)	10 (90.9)
Encouragement of players to stretch	5 (45.5)	9 (81.8)
Encouragement of players to sick for treatment		11 (100)

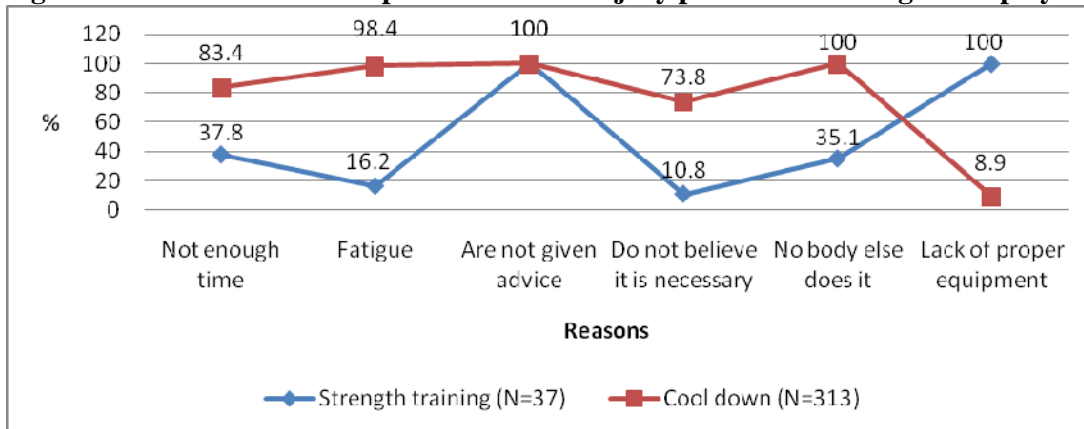
### *Observation of the medical personnel*

Team medical personnel were further asked to report if injury prevention was one of the coaches' targets in the training sessions. Five out of eleven (54.5%) reported that coaches very often or often provided training or coaching that were specifically targeted at injury prevention (safe tackling, landing, and safe heading techniques). The rest of the medical personnel (45.5%) reported that this was never done at their clubs.

## **4.5 FACTORS INFLUENCING IMPLEMENTATION OF INJURY PREVENTION STRATEGIES**

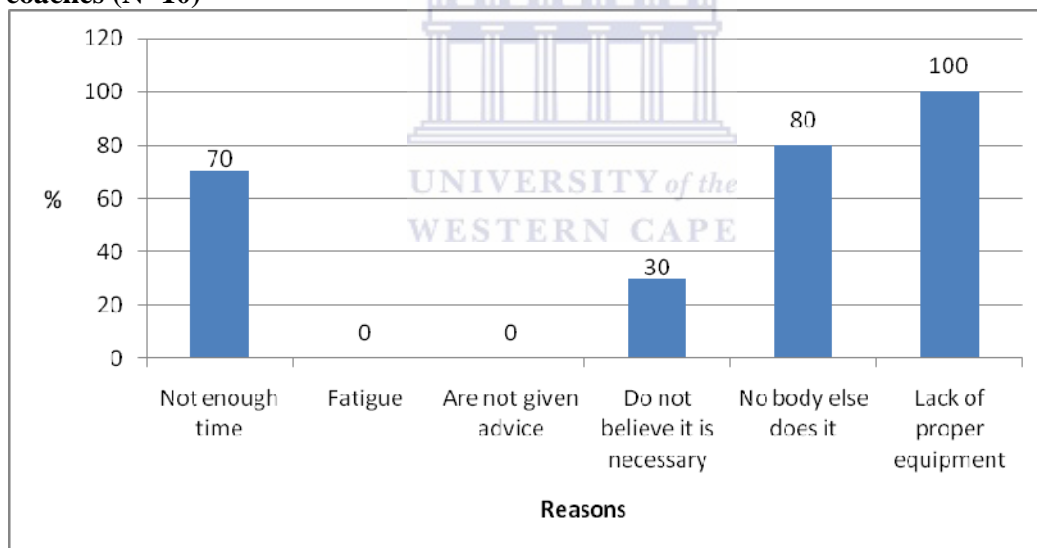
Players were asked to mention the reasons why they did not undertake strength and flexibility training at least once per week as well as warm up always before and cool down always after training and competition. Figure 4.7 indicates that the 37 players, who did not undertake strength training at least once per week, reported that it was due to lack of proper equipment (100%) and advice on the techniques (100%). Lack of time and fatigue were also given as reasons for not undertaking strength training exercise. None of the players performed cool down exercise after competition, and their reason is due to the fact that they are “Too tired after competition” (98.4%) and are “not given advice on the techniques” (100%). All the players (100%) reported that cool down was not done by someone else. The majority of players (N=231, 73.8%) reported that they did not believe it was necessary.

**Figure 4.7: Barriers to the implementation of injury prevention strategies for players**



Coaches were also asked to point out the reasons why they did not undertake strength and flexibility training at least once per week as well as warm up always before and cool down always after training and competition. Coaches reported that they had strength training at least once per week therefore this question was not applicable to them. Whereas none of them supervised cool down after competition. All of them pointed out that lack of proper equipment was one of the reasons for not supervising cool down after competition while seven coaches (70%) reported that lack of time prevented them from supervising cool down after competition. Eight coaches (80%) reported that cool down was not done by someone else while three coaches (30%) reported that they did not believe it was necessary (Figure 4.8)

**Figure 4.8: Barriers to the implementation of soccer injury prevention strategies for coaches (N=10)**



#### 4.6 SOURCE OF INFORMATION ABOUT INJURY PREVENTION

Table 4.25 illustrates that five out of nine team leaders (55.6%) reported that media was their most important source of knowledge about injury prevention followed by seminars and the team medical personnel being the least important source. Soccer players reported that coaches were the most important source of knowledge (59%) followed by team medical personnel (39.3%) and finally the media (1.6%). Team medical personnel were reported to be

the most important source of knowledge by 60% of coaches followed by media and finally seminars being the least important.

**Table 4.25: Reported source of knowledge of injury prevention (soccer players: N=313; Coaches: N=10; Leaders: N= 9)**

Variables		Soccer players	Coaches	Leaders
Source of knowledge	Characteristics	n (%)	n (%)	n (%)
Coach	Most important	185 (59.1)		
	Important	121 (38.7)		
	Least important	7 (2.2)		
Team medical personnel	Most important	123 (39.3)	6 (60)	2 (22.2)
	Important	175 (55.9)	2 (20)	2 (22.2)
	Least important	15 (4.8)	2 (20)	5 (55.6)
Media	Most important	5 (1.6)	3 (30)	5 (55.6)
	Important	17 (5.4)	3 (30)	2 (22.2)
	Least important	291 (93.0)	4 (40)	2 (22.2)
Seminars	Most important		1 (10)	2 (22.2)
	Important		5 (50)	5 (55.6)
	Least important		4 (40)	2 (22.2)

#### 4.7 SUMMARY OF THE CHAPTER

This chapter highlighted the findings of the study. The results showed that soccer players, coaches and team leaders were generally aware of the occurrence of injuries, their causes and risk factors as well as their prevention. However, deficiencies are noticeable in the implementation of injury prevention strategies especially in the use of cool down and stretching after training or competition and the use of shin guards at training. Furthermore, participants concentrated more efforts during competition than during training. Different sources of knowledge for each club stakeholder were identified. The results of this study highlighted the factors that influenced the implementation of injury prevention strategies. Chapter five follows with the discussion of the major findings of the study.

## **CHAPTER FIVE: DISCUSSION**

### **5.1 INTRODUCTION**

This chapter discusses the general knowledge of soccer players, team coaches and team leaders about injury prevention as well as their sources of information regarding injury prevention. The implementation of injury prevention strategies is also discussed. The factors that influence the implementation of injury prevention strategies among soccer community members in Rwanda are discussed. The limitations of the study are also highlighted.

### **5.2 GENERAL KNOWLEDGE OF THE PARTICIPANTS ABOUT SOCCER INJURY PREVENTION**

Objective one of this study is to identify and describe the general knowledge of soccer players, team coaches and team leaders about injury prevention. Therefore awareness of soccer players, coaches and team leaders about injury prevention was assessed.

The results of this study indicated that 130 players (41.5%) and three team leaders (33.3%) strongly agreed that the chance of sustaining an injury during training that prevents the player from being available for selection is likely to happen but this number rises to 125 players (58.5%) and four leaders (44.4%) when this was applied to the competitive match. This is in line with the observation of Willems et al. (2005) that the circumstances and the level of play may predispose players to injuries. Players and leaders might have thought about how the game is vigorous in matches than training leading to serious injuries which concur with the results of the study conducted by Twizere (2004) which indicates collision to be the most frequently injury mechanism.

The number of coaches who strongly agreed that the chances of sustaining an injury during training preventing the player from being available for selection is likely to happen is greater than those who strongly agreed that the chance of sustaining an injury during competition preventing the player from being available for selection is likely to happen (3 coaches versus 2 coaches). This is in agreement with the results of the study conducted in Rwanda indicating the high prevalence of injuries during training than competition (Twizere, 2004). This might indicate how coaches are concerned with injuries that occur during training that make the selection of more talented players difficult due to injuries.

Giza (2003) and Twizere's (2004) study show that the majority of injuries were caused by tackles and collision. These actions are mainly done by other players and 228 players (72.8%) disagreed or strongly disagreed that injuries are the consequences of the action of the other players. However this was agreed or strongly agreed by five coaches (50%) and 5 leaders (55.6%). This shows that players, coaches and leaders are aware of other risk factors that may cause serious and performance limiting non player-to-player contact injuries. This include running, cutting, kicking and jumping (Ekstrand & Gillquist, 1983). In addition, this might be an indication of the implementation of the law of fair play in Rwanda where all the team leaders reported that their clubs had a code of conduct and/or fair play policy for players (Table 4.21).

According to Ekstrand (1994), anatomically shaped shin guards can prevent injuries to the leg. This was agreed and strongly agreed by all the players, coaches and leaders (Table 4.7). This was higher comparing to similar studies conducted by Hawkins and Fuller (1998a) which indicates that 30 out of 51 players (58.8%) agreed that the use of shin guards reduces the risk of lower leg injuries. Being aware of the importance of wearing shin guards in reducing the risk of injuries, soccer players in Rwanda could be able to use them regularly.



However, almost all the players (97.7%) and eight coaches (80%) disagreed or strongly disagreed that the majority of the players wear shin guards during training.

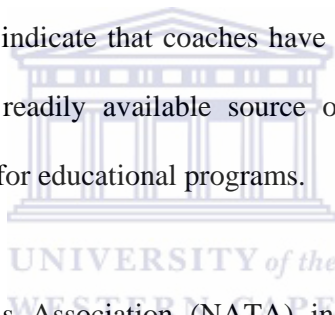
Hawkins and Fuller (1998a) indicated that 17 out of 55 players (30.9%) agreed that risk of injury is reduced by thoroughly cooling down and stretching after training or competition which is lower compared to the results of this study where 138 out 313 players (44.1%) agreed or strongly agreed with the benefits of cooling down. In addition, all the coaches and seven team leaders (77.8%) agreed or strongly agreed with the importance of cool down in injury prevention. Therefore, players and coaches working together could be able to use cool down in preventing injuries.

A number of studies indicated the benefits of strength training in injury prevention (Heidt et al., 2000; Askling et al., 2003). More than half of the players (57.8%), nine coaches (90%) and eight leaders (88.9%) agreed or strongly agreed that strong muscles are important in the protection against injuries. Higher percentage of players (83.6%) who were aware of the benefits of strength training in injury prevention were found in the study conducted by Hawkins and Fuller (1998a).

Generally, soccer players, team coaches and team leaders are aware of the occurrence of injuries, their causes and risk factors and the importance of injury prevention strategies except cool down and strength training which could hinder their implementation. Therefore there is need for education to enhance their knowledge as to the benefits of the use of different injury prevention strategies.

### **5.3 REPORTED SOURCE OF KNOWLEDGE REGARDING INJURY PREVENTION**

Objective three of this study is to establish the source of knowledge of soccer injury prevention of soccer players, team coaches and team leaders in Rwanda. This part discusses several sources that might influence the knowledge of players, coaches and leaders about injury prevention. More than half of the soccer players (59.1%) reported that coaches were their most important source of information regarding injury prevention. This is in agreement with the literature stating that coaches are often the only supervising staff member always available at practices (Carek, Dunn, & Hawkins, 1999; Tonino & Bollier, 2004), that coaches should enlighten players of the risk of injuries as well as the modalities for prevention (Arnheim & Prentice, 1993). These findings indicate that coaches have a significant positive influence on the player's knowledge. As a readily available source of information, coaches can be a significant point of intervention for educational programs.



The National Athletic Trainer's Association (NATA) in the United States of America position statement on emergency planning stipulates that coaches should be among the members of any athletic club trained in cardiopulmonary resuscitation, first aid and prevention of disease transmission (Andersen, Courson, Kleiner, & McLoda, 2002). In the present study, majority of the coaches reported that the medical personnel were their most important source of information regarding injury prevention. Coaches normally attend courses (workshops, seminars) during which they acquire coaching knowledge and skills and are afterwards offered coaching license (diploma) (Bergeron, 1989). It could not be ascertained if the coaches would be willing to mention the medical personnel working in the team or the medical personnel that teach them during the courses. Nevertheless, from the findings of this study, it can be inferred that the medical personnel could be crucial in teaching coaches about injury prevention. This will not necessarily be an extra burden (for

the medical personnel), since the provision of education to the athletes and coaches about the risks, precautions, prevention, treatment and rehabilitation of injuries is one of their duties in the team (Tippett, 1990).

This study also indicates that over half of team leaders reported that media was their most important source of information regarding injury prevention. For the purpose of this study, magazines, internet, television, books and journal articles were classified as media (Sefton, 2003). Many of the team leaders have some level of academic qualification, and by inference would read as a habit. Therefore, in addition to organizing workshops, the provision of pamphlets, posters, journal articles and relevant websites on injury prevention may be of immense benefit.

#### **5.4 IMPLEMENTATION OF SOCCER INJURY PREVENTION STRATEGIES**

The second objective of this study was to identify and describe implementation of injury prevention strategies in Rwanda. The following part discusses the implementation of different injury prevention strategies as key elements raised by the findings of this study. It makes reference to the review of the literature related to injuries and their prevention mainly in soccer. Some of the key issues that will be discussed include the injury prevention strategies as well as the policies in place in the clubs and their practices.

##### **The use of injury prevention strategies**

All the players reported that they performed warm up prior to training or competition. However, the study revealed that players spent more time performing warm up before competition than before training (Table 4.10). These findings were similar the study conducted by Twizere (2004) where players performed more warm up in competition than in training. This indicates that players give value to the warm up prior to the competitive game

than to the training in order to be prepared for the game since warm help them to have greater performance, good psychological preparation, concentration and focus (Kannus, 1993) additional to the normal physical preparation. Twizere (2004) argued that the reason could be the lack of awareness of the importance and benefits of warm-up in injury prevention but this study found that 93.3% of the players agreed or strongly agreed with the benefits of warming up with respect to the risk of injuries. Therefore, it could be hypothesized that the Rwandan soccer players are more predisposed to training injuries due to inadequate warming up. However, team medical personnel indicated that they encouraged players to warm up prior to training than prior to competition (Table 4.24).

Team coaches reported that they always supervised players while performing warm up prior to training or competition. This is good according to Weaver et al. (1996) that the coach is the supervisor of the athlete in practice and competition. However, this study found that soccer players performed warm up better in competition than in training. It could be hypothesized that the quality of their supervision was not to an appropriate standard even though it was not assessed.

There is a scarcity of studies which investigated the effect of cool down after a sporting activity but some authors believe it to be of great importance in injury prevention in sports (Brukner, & Khan, 2003). In addition, Stamford (1995) explained that cooling down enhances the wash out of the waste products of muscle metabolism hence shortening the recovery time. All the players implemented cool down only after training and not after competition which is similar to the supervision of the coaches although 44.1% of players and all the coaches (100%) agreed or strongly agreed on its benefits in injury risk reduction. One of the reasons could be that they might have enough time to perform cool down during training than during competition. Furthermore, all the teams in Rwanda do not have their own

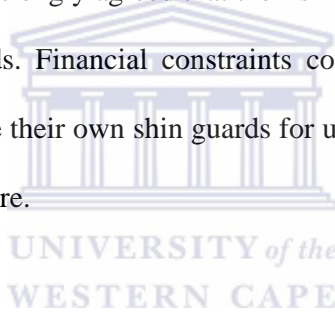
football arena, consequently they have limited time and restricted accessibility for them during the competitive games to perform cool down at the end of the match while using the governmental stadiums. Other reasons for not cooling down after competition will be discussed in the factors that influence the implementation of injury prevention strategies.

Despite the fact that stretching programme is recommended prior to and after any sporting activity (Brukner & Khan, 2003), all the players performed stretching before both training and competition. Furthermore team coaches reported that they supervised warm up and included stretching in warm up. Therefore, players could not suffer from injuries related to the lack of stretching or flexibility. It has been documented that stretching is an important component of the cool down session because it is the safest and most effective time to stretch (Allerheiligen, 1994; Blum, 2000). However, soccer players performed stretching only after training but not after competition. This study found out that soccer players did not perform cool down after the competition, explaining the reason why they do not stretch after competition. This concurs with Twizere (2004) and Hawkins and Fuller's (1998a) study which found that more players performed stretching during the cooling down after training than competition. The reasons for not stretching after the competition are similar to those of not cooling down after competition. Team medical personnel stated that they encouraged players to cool down more in competition (n=10, 90.9) than in training 5 (45.5), this shows that medical personnel might have noticed that players were not performing cool down and stretching after competition. Therefore there is a need of more emphasis as to the use of cool down and stretching after competition.

Regardless of the importance of the use of protective equipments in injury prevention (Brukner and Khan, 2003) which their use in training and competition has been therefore made compulsory by FIFA in 1990 (FIFA, 2007), the results of this study pointed out that

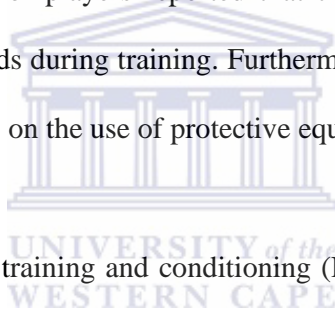
only 8 out of 313 soccer players (2.6%) used shin guards during training. This number is very few compared to the results of the similar studies (Twizere, 2004; Hawkins and Fuller, 1998). Furthermore, the infrequent use of shin guards during training has been associated with lower leg injuries (Ekstrand, 1982). Similar results have been observed in the study conducted by Twizere (2004) which found a link between the infrequent usage of shin guards in training and lower extremities training injuries among Rwandan soccer players.

In contrast, in this study more than 95% of the soccer players used shin guards during competition which is far more than Twizere (2004) and Hawkins and Fuller's (1998a) findings. This shows that the use of shin guards is given value during competition although all the soccer players agreed or strongly agreed that the risk of lower leg injuries in training is reduced by wearing shin guards. Financial constraints could be another reason for some teams where players do not have their own shin guards for use during training and at the time of competition they borrow or hire.



A number of studies indicated that prophylactic ankle bracing was effective in reducing the frequency of ankle sprains in soccer players with previous ankle problems than in players without such a history (Surve et al., 1994); Sharpe et al., 1997; Tropp et al., 1985). The study conducted in Rwanda indicated that the ankle joint was the most affected body part and one of the reasons could be the infrequent use of ankle protections mainly in training (Twizere, 2004). These findings are similar to the results of present study which found out that the number of players who always use ankle protection during training was very low (17.3%) compared to those using it during competition (29.1%). Based on this study it can be believed there is still high prevalence of ankle injuries among soccer players in Rwanda due to lack of the use of the ankle protections especially for players with previous history of ankle injuries.

According to weaver et al. (1996), it is mainly the coach who should caution against misuse of the equipment. Team coaches always (n=4, 40.0%) or very often (n=5, 50.0%) ensured that equipments were available and used by players. This might explain why soccer players do not use protective equipment frequently. In addition, the quality of the coaches' supervision and involvement in the availability, use and maintenance of protective equipment could be uncertain because coaches are very often not consulted when the team is purchasing the equipments. Despite their power only on the use of protective equipments, they may not have control of their availability as well as their appropriateness, condition and maintenance. Soccer players poorly used protective equipments in training than in competition. Additional to financial problems, another reason could be similar to the one found by Hawkins and Fuller (1998) that the majority of players reported that they were not encouraged by the coaching staff to wear shin guards during training. Furthermore, all the team leaders reported that they did not have any policy on the use of protective equipments during training.



Despite the benefits of strength training and conditioning (Heidt et al., 2000, Askling et al., 2003), 9.6% of soccer players did not do any strength training as part of the team while 11.8% reported that they did not do it individually. This situation among soccer players in Rwanda is worse compared to the situation reported in previous similar study (Hawkins & Fuller, 1998). The reasons that soccer players did not undertake strength training will be discussed in the following section. The majority of coaches reported that they always or very often (n=6, 60%) balanced fitness exercises and skills development exercises in their training sessions. They further reported that they always taught players to be aware of their training. This may explain why this study found that a great number of players performed strength training as part of the team than extra individual work.

According to Brukner and Khan (2003), nutrition aids recovery from intense exercise by replenishing glycogen stores and by providing necessary protein and water. The findings of this study indicate that attention was given to the nutrition prior to or during competition than training which concur with the study conducted by Twizere (2004) and Hawkins and Fuller, (1998). This nutritional emphasis is the same as water intake where all the players (100%) reported that they drink water after training, before and after competition but only 50 out of 313 (16%) players reported that they drink water before training. In addition, more medical personnel reported that they encouraged players to drink water in competition (n=11, 100%) than in training (n=7, 63.6%). This shows how competitive periods are given importance than training sessions. The consumption of carbohydrate and water may be related to the financial status of the teams despite the fact that more soccer players were given advice on their utilization (Twizere, 2004). In addition, the management of the teams could not understand their importance during the preparation of the players as they might think that it is only important during the competition forgetting, as stated by Brukner and Khan, (2003), that large amounts of fluid might be lost during exercise, particularly with increasing intensity and in hot or humid conditions. This may be further explained by the results of Twizere's (2004) study where more players estimated to get a sufficient quantity of water during the competitive than during training sessions.

### **Safety policies available in the clubs and their practices**

Team leaders were asked policy related questions whereas team medical practitioners were asked questions related to the practices. Only one team leader and one medical practitioner per club participated in this study.

Five out of nine teams (55.6%) had a comprehensive policy on sport safety or risk management which is similar to that reported by the study conducted by Finch and Hennessy



(2000). The percentage of teams that had such policies was more than that reported in the study conducted by Donaldson and Hill (2002) and Finch and Hennessy (2000). The authors of these studies (Finch & Hennessy, 2000; Donaldson & Hill, 2002) discussed the reasons why all the teams did not have the policies in place which could also be applicable to four out of nine teams (44.4%) in Rwanda. These include lack of information, limited resources, and the fact that the policies were not a requirement, or deemed to be necessary or relevant. It was further recommended that strategies to overcome these barriers should be developed.

As discussed above, soccer players and coaches implemented injury prevention strategies during competition than during training (warm up, hydration, protective equipments). This was the same for team medical practitioner who adopted safety practices more frequently during competition than during training. For example shin guards and boots were regularly checked by someone in authority at matches but this was not done at training. This concurs with the study by Donaldson and Hill (2002). The lack of emphasis on the implementation of injury prevention strategies during training may give the players the impression that it is not very important, and thereby predispose them to injury, as noted earlier, in the results of the study by Twizere (2004) in which a higher prevalence of injuries was reported during training than during competition.

Donaldson and Hill (2002) discussed a number of reasons which could be applicable in the Rwandan context concerning why clubs were less diligent about safety at training compared to matches. Clubs may have limited knowledge and experience of injuries occurring during training and therefore consider it less necessary to address safety issues at training. They may find it more difficult to identify qualified people who are willing to attend training sessions because the medical personnel work in hospitals or private clinics, and safety equipment might be less accessible at training due to financial limitation. Alternatively, the activities

undertaken at training, such as skill drills and fitness exercises, may not incorporate full body contact or be undertaken with maximum intensity, and therefore not be perceived to pose the same risk of injury as participation in games.

Another consideration is that the governing bodies for soccer require clubs to adopt certain safety practices at matches, and the referee or match commissioner is often readily available to ensure that requirements are met (FIFA, 2008b). It is likely that there is no designated person to ensure that safety practices are undertaken at training. In addition, there is no opposing team at training to insist that certain safety practices are adopted. It is therefore unlikely that a violation of safety practices occurring at training would be reported to the governing body.

The study observed that it was not all the club stakeholders that knew of the safety policies in place at their own clubs. Although this study did not ask whether the policies in place were written, it could be hypothesized that even the policies available in teams would not be written which could also explain the limited awareness of club stakeholders about the policies in the team. Communication is essential for the successful implementation of any policy, guideline, recommendation or regulation (Donaldson & Hill, 2002). Lack of communication could lead to a number of stakeholders having limited knowledge about the policies in place at their clubs. Therefore, future studies could investigate whether or not the policies in place in the clubs are written and if there are any means of communication in the clubs.

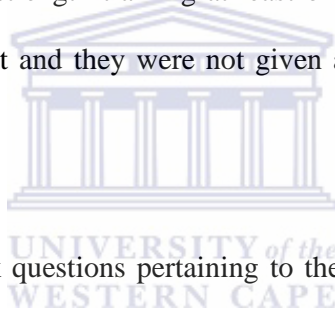
All the team leaders reported that their clubs would like access to more safety training programmes as well as assistance to develop a sport safety programme. In addition, the majority of team leaders would like the football federation and medical personnel actively support their clubs to implement safety policies and practices. These findings suggest that

FERWAFSA could potentially play an important supportive role in setting standards for sports safety and also use medical practitioners in disseminating sports safety information and resources.

## **5.5 FACTORS INFLUENCING THE IMPLEMENTATION OF INJURY**

### **PREVENTION**

Objective four of this study was to identify factors that influence the implementation of injury prevention. Players and coaches were asked to indicate all the reasons why they did not undertake strength and flexibility training at least once per week as well as always warm up before training and competition, and cool down after training and competition. The 37 players who did not undertake strength training at least once per week reported that it was due to lack of proper equipment and they were not given advice on the techniques (Figure 4.7).



Although this study did not ask questions pertaining to the financial status of the teams, it could be suggested that the lack of proper equipment may be influenced by the limited resources within the team looking at the fact that equipments required for strengthening exercises are expensive. However, this does not explain why they do not perform strengthening exercises because they are specific exercises that may be performed without any equipment and their effects have been demonstrated (Junge et al., 2002). Therefore, there is a need for a campaign to inform players and coaches about the effective exercises that do not require equipments such as the “the 11” (the exercises developed by FIFA). In addition, they should be visited by experts and given advice on the techniques at a regular basis.

The findings of this study also indicate that no player performed cool down exercise after competition, with fatigue and lack of advice proffered as reasons for not doing so. It is

believed that cooling down enhances the wash out of the waste products of muscle metabolism hence shortening the recovery time (Stamford, 1995). Therefore, cool down could help them to recover from fatigue after the game. As discussed earlier, all the teams in Rwanda do not have their own stadiums; therefore they have limited time and access to the ones reserved for the games where they are needed to leave immediately after the game. In addition, the results of this study further indicate that 73.8% of players and 30% coaches report that they did not believe it was necessary. This could be explained by the results of this study which found that no player performed cool down after competition. Finally, all the players and eight coaches (80%) reported that cool down was not done by any person in other teams.

## **5.6 LIMITATION OF THE STUDY**

This study was not free from limitations which were identified as follows:

- The results of this study were self-reported therefore the accuracy of the information may not be possible due to the reporting bias.
- Despite the effort made, it was very difficult to find all the participants because a number of them were on leave, while others were out of the country.
- For team coaches, team leaders and team medical practitioners, only one for each club participated in this study. Therefore, the information gathered could be limited to that particular individual's knowledge.
- Sports safety policies available in the clubs, injury prevention strategies and safety practices implemented were assessed but the detailed information about their quality was not gathered.
- This study did not ask whether the policies in place were written or not.

## 5.7 SUMMARY OF THE CHAPTER

The discussion dealt with the major findings of the study. Comparison with other studies was made with regard to the knowledge of the participants about injury prevention and their source of information, the implementation of injury prevention strategies as well as the factors that influenced the implementation. Finally the limitations of the study were mentioned. In the following chapter, a comprehensive summary of the findings is presented together with the conclusion and the implications of the study. Areas that need to be researched further are identified ahead of the recommendations that the current study was able to identify.



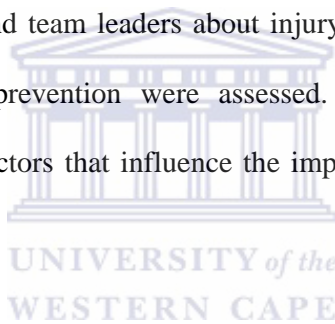
## CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATION

### 6.1 INTRODUCTION

This chapter emphasizes the findings of the study by highlighting the summary and the conclusion. Suggested recommendations are made and the significance of the study is highlighted at the end of this chapter.

### 6.2 SUMMARY

The aim of this study was to identify factors associated with implementation of soccer injury prevention strategies in Rwanda. In order to achieve this aim, the general knowledge of soccer players, team coaches and team leaders about injury prevention and their sources of information regarding injury prevention were assessed. The implementation of injury prevention strategies and the factors that influence the implementation of injury prevention strategies were also assessed.



Soccer players, team coaches and team leaders had sufficient knowledge regarding injuries in general. However, soccer players' knowledge was deficient as to the causes and risk factors of injuries, the appreciation of the use of cool down after training and competition, stretching and flexibility, and strength and conditioning in injury risk reduction.

The most important source of information regarding injury prevention for players was the coaches while the most important source of information for team coaches and team leaders was the medical practitioners and the media respectively. This informs on the sources of information for each team member that could be used in the intervention.

Injury prevention strategies such as the use of protection, warm up, water intake, carbohydrate consumption were performed more in competition than in training while cool down and stretching were regularly performed in training than in competition. The reasons given for not adequately implementing injury prevention strategies included lack of proper equipment and advice on techniques, shortage of time and being exhausted after competition.

The result of this study indicates that few soccer teams in Rwanda had safety policies and many of them implemented the limited safety policies they have to some extent for the safety for their players. The teams addressed more safety issues at matches than at training. Teams were also interested in receiving information and assistance in safety issues.

### **6.3 CONCLUSION**

Generally, soccer players, coaches and team leaders in Rwanda have satisfactory knowledge of injuries. However, soccer players' awareness is deficient as to the causes and risk factors of injuries, the use of cool down after training and competition, stretching and flexibility, and strength and conditioning.

Injury prevention strategies and/ or policies were not regularly implemented. Clubs emphasize the implementation of injury prevention strategies more at competitive matches than during training.

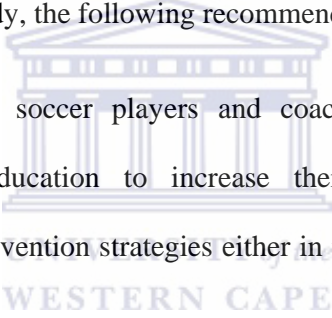
The most important sources of information regarding injury prevention were found to be the coaches, team medical practitioners and the media. Interventions to improve injury prevention should therefore include the coaches, team medical practitioner and media. The

teams indicated that they will be willing to accept assistance in injury prevention techniques and equipment.

There is a need to provide education to increase the general knowledge about the prevention of injuries in the soccer community and also overcome all the identified barriers that render the implementation difficult or impossible. There is also a need to support teams to develop meaningful and relevant policies.

## **6.4 RECOMMENDATIONS**

Based on the findings of this study, the following recommendations were made:

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1. Intervention directed to soccer players and coaches in form health promotion programmes through education to increase their knowledge and support in implementation of all prevention strategies either in training or in competition should be provided.
  2. Clubs should develop, implement and monitor a comprehensive sport safety plan paying particular attention to the development and implementation of policies covering issues that this study has identified as being poorly addressed.
  3. Clubs should ensure that all safety measures are observed and implemented at both training session and during competition.
  4. Governing bodies in Rwanda, especially FERWAFa should develop and disseminate written sports safety policies and guidelines and supervise clubs in their development, implementation and monitoring.



## REFERENCES

Allerheiligen, W.B. (1994). Stretching and warm-up. In: Baechle, T.R. (Ed.), *Essentials of Strength Training and Conditioning* (pp. 301-311). Human Kinetics: Champaign, Illinois.

Andersen, J.C., Courson, R.W., Kleiner, D.M., & McLoda, T.A. (2002). National Athletic Trainers' Association Position Statement: Emergency Planning in Athletics. *Journal of Athletic Training*, 37(1), 99-104.

Andersen, T.E., Floerenes, T.W., Arnason, A., & Bahr, R. (2004). Video analysis of the mechanisms for ankle injuries in football. *American Journal of Sports Medicine*, 32 (Suppl1), 69-79.

Anderson, M.K., Hall, S.J., & Martin, M. (Eds.). (2000). *Sports injury management*. (2<sup>nd</sup> ed.). Lippincott Williams & Wilkins. Baltimore, Maryland. pp. 2-58.

Arnason, A., Andersen, T.E., Holme, I., Engebretsen, L., & Bahr, R. (2008). Prevention of hamstring strains in elite soccer: an intervention study. *Scandinavian Journal of Medicine & Science in Sports*, 18, 40-48.

Arnason, A., Engebretsen, L., & Bahr, R. (2005). No effect of a video-based awareness program on the rate of soccer injuries. *American Journal of Sports Medicine*, 33, 77-84.

Arnason, A., Gudmundsson, A., Dahl, H.A., & Johannsson, E. (1996). Soccer injuries in Iceland. *Scandinavian Journal of Medicine & Science in Sports*, 6, 40-45.

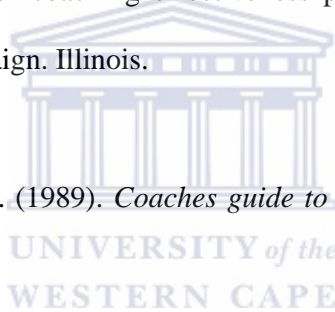
Arnason, A., Sigurdsson, S.B., Gudmundsson, A., Holme, I., Engebretsen, L., & Bahr, R. (2004). Risk factors for injuries in football. *American Journal of Sports Medicine*, 33, 5-16.

Arnheim, D.D., & Prentice, W.E. (1993). *Principles of athletic training*. (8<sup>th</sup> Ed.), Mosby-Year book, St. Louis, Missouri. pp.246-267.

Askling, C., Karlsson, J., & Thorstensson, A. (2003). Hamstring injury occurrence in elite soccer players after preseason strength training with eccentric overload. *Scandinavian Journal of Medicine & Science in Sports*, 13, 244-250.

Bergeron, D.J. (1989). American coaching effectiveness program. Level 2. Sport injuries. Human Kinetics Books, Champaign. Illinois.

Bergeron, D.J., & Greene, H.W. (1989). *Coaches guide to sports injuries*. Human Kinetics, Champaign. USA.



Best, T.M. & Garrett, W.E. (1993). Muscle-tendon unit injuries. In P.A.F.H. Renström (Ed.), *Sports injuries, Basic principles of prevention and care* (pp.71-86). Blackwell scientific publications. Oxford.

Bixler, B., & Jones, R.L. (1992). High-school football injuries: effects of a post-halftime warm-up and stretching routine. *Family Practice Research Journal*, 12(2), 134-139.

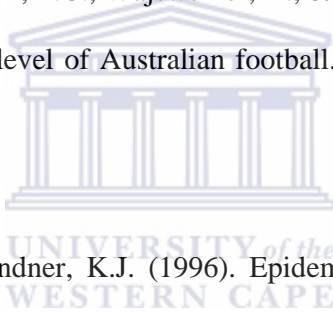
Bloomfield, J., Polman, R., & O'Donoghue, P. (2007). Physical demands of different positions in FA Premier League soccer. *Journal of Sports Science and Medicine*, 6, 63-70.

Blum, J. (2000). Stretching for flexibility fitness. Institute for aerobics research. Public Safety Fitness Specialist Course Notebook. Dallas. Retrieved July 18, 2008 at 12:00 from <http://www.jus.state.nc.us/NCJA/w-jb-1099.htm>

Brukner, P. (1993). Nutrition and diet. In P.A.F.H. Rengtrom (Ed.), *Sports injuries, Basic principles of prevention and care* (pp. 297-312). Blackwell Scientific Publications.

Brukner, P., & Khan, K. (2003). *Clinical sports medicine*. (2<sup>nd</sup> edition) Sydney, McGraw-Hill. pp. 372-391.

Cabbie, B. J., Brunell, K.L., Finch, F.C., Wajswelner, H., & Orchard, J.W. (2006). Predictors of hamstring injury in the elite level of Australian football. *Scandinavian Journal of Sports Medicine*, 16(1), 7-13.



Caine, D.J., Caine, C.G., & Lindner, K.J. (1996). Epidemiology of sports injuries. USA. Human Kinetics Publishers.

Canadian Soccer Association (2003). Demographic report: Player registrations Retrieved March 13, 2007 at 15:20 from [http://www.canadasoccer.com/eng/docs/2003\\_demographics\\_report.pdf](http://www.canadasoccer.com/eng/docs/2003_demographics_report.pdf).

Caraffa, A., Cerulli, G., Projetti, M., Aisa, G., & Rizzo, A. (1996). Prevention of anterior cruciate ligament injuries in soccer. A prospective controlled study of proprioceptive training. *Knee Surgery Sports Traumatology Arthroscopy*, 4, 19-21.

Carek, P.J., Dunn, J., & Hawkins, A. (1999). Health care coverage of high school athletics in South Carolina: does school size make a difference? *Journal of the Southern Carolina Medical Association*, 95(11), 420-425.

Casey, M., Finch, C.F., Mahoney, M., & Townsend, M. (2004). Sport safety policies and practices in two rural Victorian communities. *Journal of Science and Medicine in Sport*, 7(2), 226-231.

Chandler, T.J., & Kibler, W.B. (1993). Muscle training in injury prevention. In P.A.F.H. Renström (Ed.), *Sports injuries, Basic principles of prevention and care* (pp.252-261). Blackwell scientific publications. Oxford.

Chomiak, J., Junge, A., Peterson, L., & Dvorak, J. (2000). Severe injuries in football players. Influencing factors. *American Journal of Sports Medicine*, 28, S58-S68.



Confederation of African Football (CAF) (2006). CAF Activities Report 2006. Retrieved March 28, 2007 at 11:56 from [http://www.cafonline.com/news\\_press\\_release/activity\\_report07.pdf](http://www.cafonline.com/news_press_release/activity_report07.pdf)

Damoiseaux, V., & Kok, G. (1993). Principles of health education. In P.A.F.H. Renström (Ed.), *Sports injuries, Basic principles of prevention and care* (pp. 343-352). Blackwell scientific publications. Oxford.

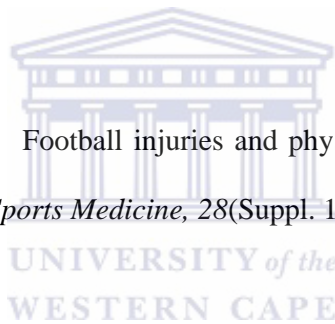
De Vos, A.S., Strydom, H., Fouché, C. B., & Delport, C. L. S. (2002). *Research at Grass Roots. For the social sciences and human service professions.* (2<sup>nd</sup> ed). Pretoria: Van Schaik Limited.

Deakin, V., & Brotherhood, J.R. (1992). Nutrition and energy source. In J. Bloomfield, P.A. Fricker, K.D. & Fitch (Eds.), *Textbook of Science and Medicine in Sport* (pp. 87-113). Blackwell Scientific Publications. Australia.

Donaldson, A., & Hill, T. (2002). *The sport safety policies and practices of community soccer clubs: on the northern beaches and in the Hornsby-Ryde-Ku-Ring-Gai region of Northern Sydney*. Sydney.

Drawer, S., & Fuller, C.W. (2002). Evaluating the level of injury in English professional football using a risk based assessment process. *British Journal of Sports Medicine*, 36, 446-451.

Dvorak, J., & Junge, A. (2000). Football injuries and physical symptoms. A review of the literature. *American Journal of Sports Medicine*, 28(Suppl. 1), 3-9.



Dvorak, J., Junge, A., Chomiak, J., Graf-Baumann, T., Peterson, L., & Rösch D., et al. (2000). Risk factor analysis for injuries in football players: Possibilities for a prevention program. *American Journal of Sports Medicine*, 28(5), 69-74.

Ekstrand, J. (1994). Injuries in soccer: prevention. In P. A. F. H. Renstöm (Ed.), *Clinical practice of sports injury prevention and care* (pp. 285-293). Cambridge: Blackwell Scientific Publications.

Ekstrand, J., & Gillquist, J. (1983). The avoidability of soccer injuries. *International Journal of Sports Medicine*, 4, 124-128.

Ekstrand, J., & Gillquist, J. (1984). Prevention of sport injuries in football players. *International journal of sports medicine*, 5(suppl.1), 140-144.

Ekstrand, J., & Karlsson, J. (2003). The risk for injury in football. There is a need for a consensus about definition of injury and the design of studies. *Scandinavian Journal of Medicine and Science in Sports*, 13, 147-149.

Ekstrand, J., & Nigg, B. (1989). Surface related injuries in soccer. *Sports Medicine*, 8, 56-62.

Ekstrand, J., & Tropp, H. (1990). The incidence of ankle sprains in soccer. *Foot Ankle*, 11, 41-44.

Ekstrand, J., Gillquist, J., & Liljedahl, S-O. (1983). Prevention of soccer injuries. Supervision by doctor and physiotherapist. *American Journal of Sports Medicine*, 11, 116-120.



Ekstrand, J., Waldén, M., & Hägglund, M. (2004). Risk for injury when playing in a national football team. *Scandinavian Journal of Medicine and Science in Sports*, 14, 34-38.

Elias, S.R., Roberts, W.O., & Thorson, D.C. (1991). Team sports in hot weather: guidelines for modifying youth soccer. *The Physician and Sports Medicine*, 19(5), 67-78.

Emery, C.A. (2005). Injury prevention and future research. In N. Muffuli, D.J. Caine (Eds.), *Epidemiology of pediatric sports injuries: Team sports* (pp. 170-191). Medicine and Sports Science. Basel, Karger.

Emery, C.R., & Meeuwisse, W.H. (2006). Risk factors for injury in indoor compared with outdoor adolescent soccer. *American Journal of Sports Medicine*, 34(10), 1636-1643.

Fédération International de Football Association (FIFA), (2008a). Rwanda. Retrieved August 12, 2008 at 11:52 from [http://www.fifa.com/mm/goalproject/rwa\\_eng.pdf](http://www.fifa.com/mm/goalproject/rwa_eng.pdf)

Fédération International de Football Association (FIFA), (2008b). FIFA laws of the game. Retrieved November 06, 2008 at 02:51 from <http://www.thefa.com/NR/rdonlyres/095F9568-466D-4D71-ABF5-C1253A1C28FD/151521/FifaLawsOfTheGame0809.pdf>

Fédération Rwandaise de Football Association (FERWAFa), (2008). Retrieved March 26, 2008 at 03:45 from [www.ferwafa.rw](http://www.ferwafa.rw).



Finch, C., & Hennessy, M. (2000). The safety practices of sporting clubs/centres in the city of Hume. *Journal of Science & Medicine in Sport*, 3, 9-16.

Frantz, J.M., Amosun, S.L., & Weitz, W. (1999). Injuries among adolescent soccer players during an interprovincial tournament in South Africa. *South African Journal of Sports Medicine*, 6(2), 13-15.

Fuller, C.W., Ekstrand, J., Junge, A., Andersen, T.E., Bahr, R., & Dvorac, J., et al. (2006). Consensus statement on injury definitions and data collection procedure in studies of football (soccer) injuries. *Scandinavian Journal of Medicine and Science in Sports*, 16, 83-92.

Fuller, C.W., Smith, G.L., Junge, A. & Dvorac, J. (2004). An assessment of player error as an injury causation factor in international football. *American Journal of Sports Medicine*, 32, S28-S35.

Galloway, S.D. (1999). Dehydration, rehydration, and exercise in the heat: rehydration strategies for athletic competition. *Canadian journal of applied physiology*, 24, 188-200.

Giza, E., Fuller, C., Junge, A., & Dvorak, J. (2003). Mechanisms of foot and ankle injuries in soccer. *American Journal of Sports Medicine*, 31, 550-554.

Glanz, K., Marcus, F.L., & Rimer, B.K. (1990). *Health behavior and health education. Theory, research and practice*. Jossey-Bass Publishers, San Francisco.

Godfrey, C. (1997). Is prevention better than cure? In M. Sidell, L. Jones, J. Katz, & A. Peberdy (eds.), *Debates and dilemmas in promoting health* (pp.181-189). A reader. Palgrave, New York.

Goodman, D., Bradley, N.L., Paras, B., Williamson, I.J., & Bizzochi, J. (2006). Video gaming promotes concussion knowledge acquisition in youth hockey players. *Journal of Adolescence*, 29, 351-360.

Hägglund, M. (2007). *Epidemiology and prevention of football injuries*. Linköping University Medical Dissertations. No. 989.

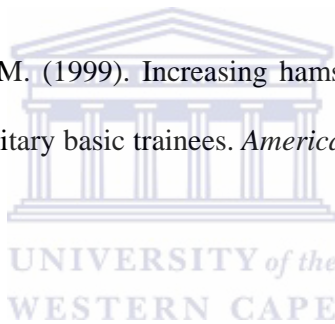


Hägglund, M., Waldén, M., & Ekstrand, J. (2004). Injury incidence and distribution in elite football: a prospective study of the Danish and the Swedish top divisions. *Scandinavian Journal of Medicine and Science in Sport*, 15, 21-28.

Hägglund, M., Waldén, M., Bahr, R., & Ekstrand, J. (2005). Methods of epidemiological study of injury to professional football players: Developing the UEFA model. *British Journal of Sports Medicine*, 39(6), 340-346.

Hakizimana, M. (2002). *Football injuries and their management in Rwanda*. Unpublished advanced diploma dissertation. Kigali Health Institute. Kigali, Rwanda.

Harting, D.E., & Henderson, J.M. (1999). Increasing hamstring flexibility decreases lower extremity overuse injuries in military basic trainees. *American Journal of Sport Medicine*, 27, 173-176.



Harvey, L., Herbert, R., & Crosbie, J. (2002). Does stretching induce lasting increases in joint ROM? A systematic review. *Physiotherapy Research International*, 7(1), 1-13.

Hawkins, R.D., & Fuller, C.W. (1998a). A preliminary assessment of professional footballers' awareness of injury prevention strategies. *British Journal of Sports Medicine*, 32(4), 140-143.

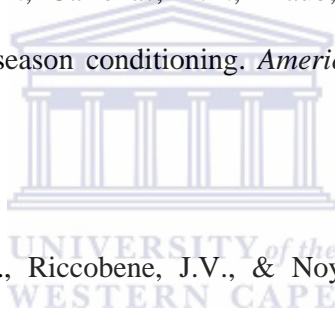
Hawkins, R.D., & Fuller, C.W. (1998b). An examination of the frequency and severity of injuries and incidents at three levels of professional football. *British Journal of Sports Medicine*, 32(4), 326-332.

Hawkins, R.D., & Fuller, C.W. (1999). A prospective epidemiological study of injuries in four professional football clubs. *British Journal of Sports Medicine*, 33, 196-203.

Hawkins, R.D., Hulse, M.A., Wilkinson, C., Hodson, A., & Gibson, M. (2001). The association football medical research programme: an audit of injuries in professional football. *British Journal of Sports Medicine*, 35, 43-47.

Hedrick, A. (1992). Physiological responses to warm-up. *National Strength and Conditioning Association Journal*, 14(5), 25-27.

Heidt, J.R.S., Sweeterman, L.M., Carlonas, R.L., Traub, J.A., & Tekulve F.X. (2000). Avoidance of injuries with preseason conditioning. *American Journal of Sports Medicine*, 28(5), 659-662.



Hewett, T.E., Lindenfeld, T.N., Riccobene, J.V., & Noyes, F.R. (1999). The effect of neuromuscular training on the incidence of knee injury in female athletes: a prospective study. *American Journal of Sports Medicine*, 27, 699-706.

Inklaar, H. (1994). Soccer injuries. Incidence and severity. *Sports Medicine*, 18, 55-73.

Johnson, U., Ekengren, J., & Andersen, M.B. (2005). Injury prevention in Sweden. Helping soccer players at risk. *Journal of Sport Exercise Psychology*, 1, 32-38.

Jorgensen, U., & Ekstrand, J. (1988). Significance of heel pad confinement for the shock absorption at heel strike. *International Journal of Sports Medicine*, 9, 468-473.

Junge, A. (2000). The influence of psychological factors on sports injury – Review of the literature. *American Journal of Sports Medicine*, 28(Suppl. 5), 10-15.

Junge, A., & Dvorac, J. (2000). Influence of definition and data collection on the incidence of injuries in football. *American Journal of Sports Medicine*, 28(Suppl. 5), 40-46.

Junge, A., & Dvorac, J. (2004). Soccer injuries – A review on the incidence and prevention. *Sports Medicine*, 34(13), 929-938.

Junge, A., Chomiak, J., & Dvorac, J. (2000). Incidence of football injuries in youth players – Comparison of players from two European regions. *American Journal of Sports Medicine*, 28(Suppl. 5), 47-50.

Junge, A., Dvorac, J., Chomiak, J., Peterson, L., & Graf-Baumann, T. (2000). Medical history and physical findings in football players of different ages and skill levels. *American Journal of Sports Medicine*, 28(Suppl. 5), 16-21.

Junge, A., Dvorac, J., Rosch, D., Graf-Baumann, T., Chomiak, J., & Peterson, L. (2000). Psychological and sport-specific characteristics of football players. *American Journal of Sports Medicine*, 28(Suppl. 5), 22-28.

Junge, A., Dvorac, J., & Graf-Baumann, T. (2004). Football injuries during the World Cup 2002. *American Journal of Sports Medicine*, 32(suppl 1), 23-27.

Junge, A., Dvorak, J., Graf-Baumann, T., & Peterson, L. (2004). Football injuries during FIFA tournaments and the Olympic Games 1998-2001-Development and implementation of an injury-reporting system. *American Journal of Sports Medicine*, 32(Suppl. 1), 80-89.

Junge, A., Khouaja, F., & Dvorak, J. (2002). Incidence and Characteristics of Injuries in Tunisian Professional Football League. Internal report.

Junge, A., Rosch, D., Peterson, L., Graf-Baumann, T., & Dvorac, J. (2002). Prevention of soccer injuries: a prospective intervention in youth amateur players. *American Journal of Sports Medicine*, 30(4), 652-659.

Kakaverakis, K.N., Vlazakis, S., Vlahakis, I., & Charissis, G. (2003). Soccer injuries in childhood. *Scandinavian Journal of Medicine and Science in Sports*, 13, 175-178.

Kannus, P. (1993). Body composition and predisposing diseases in injury prevention. In P.A.F.H. Rengtrom (Ed.), *Sports injuries, Basic principles of prevention and care* (pp. 161-176). Blackwell Scientific Publications.

Kibler, W.B. (1993). Injuries in adolescent and preadolescent players. *Medicine and Science in Sports and exercises*, 25, 1330-1335.

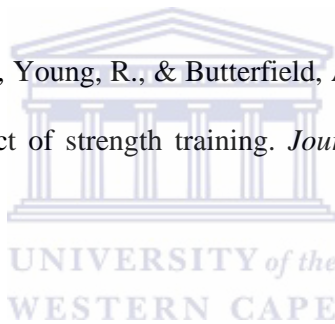
Kibler, W.B., & Chandler, T.J. (1993). Sport-specific screening and testing. In P.A.F.H. Renström (Ed.), *Sports injuries, Basic principles of prevention and care* (pp.223-241). Blackwell scientific publications. Oxford.

Krosshaug, T., Andersen, T.E., Olsen, O-E.O., Myklebust, G., & Bahr, R. (2005). Research approaches to describe the mechanisms of injury in sports: limitation and possibilities. *British Journal of Sports Medicine*, 39, 330-339.

Larson, M., Pearl, A. J., Jaffet, R., & Rudawsky, A. (1996). Soccer. In D.J. Caine, C.G. Caine, & K.J. Lindner (Eds.), *Epidemiology of sports injuries* (pp.387-398). Human Kinetics Publishers. USA.

Lawrence, D. (2008). Injuries have causes -- they don't simply befall us from fate or bad luck. Retrieved March 14, 2008 at 10:11 from <http://www.injuryprevention.org/>

Lehnhard. R.A., Lehnhard, H.R., Young, R., & Butterfield, A. (1996). Monitoring injuries on a college soccer team: the effect of strength training. *Journal of Strength & Conditioning Research*, 10, 115-119.



Leininger, R.E., Knox, C.L., & Comstock, R.D. (2007). Epidemiology of 1.6 million pediatric soccer-related injuries presenting to US emergency departments from 1990 to 2003. *American Journal of Sports Medicine*, 35(2), 288-294.

Lüthje, P., Nurmi, I., Kataja, M., Belt, E., Helenius, P., & Kaukonen, J.P., et al. (1996). Epidemiology and traumatology of injuries in elite soccer: a prospective study in Finland. *Scandinavian Journal of Medicine and Science in Sports*, 6, 180-185.

Magnusson, P., Simonsen, E., Aagaard, H., Sorensen, H., & Kjer, M. (1996). A mechanism of altered flexibility in human skeletal muscle. *Journal of Physiology*, 497, 291-298.

McCullough, C. (1990). Stretching for injury prevention. *Patient Management*, 61-67.

McGrath, A.C., & Ozanne-Smith, J. (1997). *Heading injuries out of soccer: A review of the literature*. Monash University Accident Research Centre – Report No. 125.

Meeuwisse, W.H. (1994) Assessing causation in sport injury: a multifactorial model. *Clinical Journal of Sports Medicine*, 4, 166-170.

Mendelbaum, B.R., Silvers, H.J., Watanabe, D.S., Knarr, J.F., Thomas, S.D., & Griffin, L.Y., et al. (2005). Effectiveness of a neuromuscular and proprioceptive training program in preventing anterior cruciate ligament injuries in female athletes. *American Journal of Sports Medicine*, 33(7), 1011-1015.

Monteiro, C.R., Guerra, I., & Leite de Barros, T. (2003). Hydration in soccer: a review. *Revista Brasileira de Medicina do Esporte*, 9(4), 243-246.

Morgan, B.E., & Oberlander, M.A. (2001). An examination of injuries in major league soccer: the inaugural season. *American Journal of Sports Medicine*, 29(4), 426-30.

Mugabe, B. (February 19, 2008). Cecafa assured of Kagame' paquage. Retrieved April 26, 2008 at 01:38 from [www.newtimes.co.rw](http://www.newtimes.co.rw)

Nielsen, A.B., & Yde, J. (1989). Epidemiology and traumatology of injuries in soccer. *American Journal of Sports Medicine*, 17(6), 803-807.

Nigg, B. M., & Yeadon, M. R. (1987). Biomechanical aspects of the playing surface. *Journal of Sports Sciences*, 5, 117-145.

Nkuutu, H. (March 23, 2008). Rwanda takes share of \$70 million Fifa grant. Rwandan. Retrieved March 26, 2008 at 01:50 from <http://www.newtimes.co.rw>

Nuhu, A. (2004). *The profile of football-related injuries among players in the first division of 2003 four male Rwandan soccer teams*. Unpublished advanced diploma dissertation. Kigali Health Institute. Kigali, Rwanda.

Oakes, B.W. (2003). Tissue healing and repair: Tendons and ligaments. In W.R. Frontera (ed.), *Rehabilitation of sports injuries: Scientific basis*. Blackwell Science. Massachusetts, USA.

Olsen, L., Scanlan, A., MacKay, M., Babul, S., Reid, D., & Clark, M., et al. (2004). Strategies for prevention of soccer related injuries: a systematic review. *British Journal of Sports Medicine*, 38, 89-94.

Olsen, O.E., Myklebust, G., Engebretsen, L., Holme, I., & Bahr, R. (2005). Exercises to prevent lower limb injuries in youth sports: cluster randomised controlled trial. *British Medical Journal*, 330, 449-452.

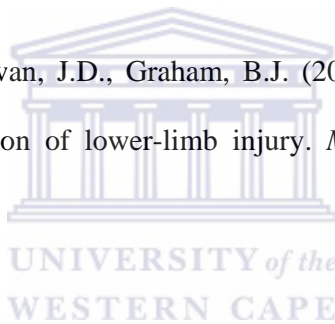
Online Encyclopedia, (2007). Football (Soccer). Retrieved June 12, 2008 from [http://www.fact-archive.com/encyclopedia/Football\\_\(soccer\)](http://www.fact-archive.com/encyclopedia/Football_(soccer))

Orchard, J., & Seward, H. (2002). Epidemiology of injuries in the Australian Football League, seasons 1997-2000. *British Journal of Sports Medicine*, 36, 39-44.

People's Daily Online (September 16, 2006). Sports losing whisky, cell phones in South Africa. Retrieved March 28, 2007, at 11:29 from [http://english.people.com.cn/200609/16/eng20060916\\_303478.html](http://english.people.com.cn/200609/16/eng20060916_303478.html)

Pope, R.P., Herbert, R.D., & Kirwan, J.D. (1998). Effects of ankle dorsiflexion range and pre-exercise calf muscle stretching on injury risk in army recruits. *Australian Journal of Physiotherapy*, 44, 165-177.

Pope, R.P., Herbert, R.D., Kirwan, J.D., Graham, B.J. (2000). A randomized trial of pre-exercise stretching for prevention of lower-limb injury. *Medicine & Science in Sport & Exercise*, 32, 271-277.



Putukian, M. (2000). Soccer. In B.L. Drinkwater (Ed.), *Women in sport* (pp. 575-599). Blackwell Science. London.

Raymond, G.Jr. (ed.), (2005). *Ethnologue: Languages of the World*, (15<sup>th</sup> edition). Dallas, Tex.: SIL International. Retrieved April 23, 2008 at 23:02 from [http://www.ethnologue.com/show\\_country.asp?name=rw](http://www.ethnologue.com/show_country.asp?name=rw)

Rosch, D., Hodgson, R., Peterson, L., Graf-Baumann, T., Junge, A., Chomiak, J., & Dvorac, J. (2000). Assessment and evaluation of football performance. *American Journal of Sports Medicine*, 28(Suppl. 5), 29-39.



Safran, M.R., Seaber, A.V., & Garrett, W.E. (1989). Warm-up and muscular injury prevention-an update. *Sports Medicine*, 8(4), 239-249.

Sando, B.G. (1992). The team physician. In J. Bloomfield, P.A. Fricker, K.D. & Fitch (Eds.), *Textbook of Science and Medicine in Sport* (pp. 421-435). Blackwell Scientific Publications. Australia.

Sarantakos, S. (Ed.). (2005). Principles of social research. In *Social research*. Palgrave Macmillan.

Sefton, J.M. (2003). *An examination of factors that influence knowledge of and reporting of head injuries in college football*. Unpublished Masters Thesis. Central Connecticut University, New Britain, Connecticut.

Sharkey, B.J., & Gaskill, S.E. (2006). *Sport physiology for coaches*. Human Kinetics. Champaign. USA.

Sharpe, S.R., Knapik, J., & Jones, B. (1997). Ankle braces effectively reduce recurrence of ankle sprains in female soccer players. *Journal of Athletic Training*, 32, 21-24.

Shrier, I. (1999). Stretching before exercise does not reduce the risk of local muscle injury: a critical review of the clinical and basic science literature. *Clinical Journal of Sport Medicine*, 9(4), 221-227.

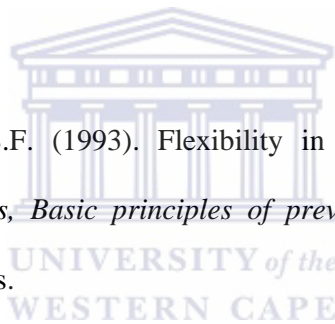
Shrier, I., & Gossal, K. (2000). Myths and truths of stretching. Individualized recommendations for healthy muscles. *The Physician and Sports Medicine*, 28(8), 1-11.

Social Issues Research Centre (SIRC), (2008). Football passions. Retrieved August 15, 2008 at 06:13 from [http://www.sirc.org/football/football\\_passions.pdf](http://www.sirc.org/football/football_passions.pdf)

Soderman, K., Werner S., Pietila, T., Engstrom, B., & Alfredson H. (2000). Balance board training: prevention of traumatic injuries of the lower extremities in female soccer players? A prospective randomized intervention study. *Knee Surgery Sports Traumatology Arthroscopy*, 8(6), 356-363.

Stamford, B. (1995). How to warm-up and cool-down your workout. *Physician and Sports Medicine*, 23(9), 97-98.

Stanish, W.D., & McVicar, S.F. (1993). Flexibility in injury prevention. In P.A.F.H. Rengtrom (Ed.), *Sports injuries, Basic principles of prevention and care* (pp. 262-276). Blackwell Scientific Publications.



Surve, I., Schweltnus, M.P., Noakes, T., & Lombard, C. (1994). A fivefold reduction in the incidence of recurrent ankle sprains in soccer players using the Sport-Stirrup orthosis. *American Journal of Sports Medicine*, 22, 601-606.

The Globalist (November 21, 2005). African Soccer Goes Global. Retrieved March 28, 2007 at 10:19 from [http://www.cgdev.org/doc/Book%20Reviews/TheGlobalist\\_BestandBrightest.pdf](http://www.cgdev.org/doc/Book%20Reviews/TheGlobalist_BestandBrightest.pdf)

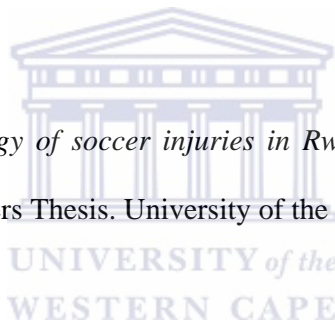
Tippett, S.R. (1990). *Coaches Guide to Sports Rehabilitation*. Human Kinetics. Champaign, USA.

Tonino, P.M., & Bollier, M.J. (2004). Medical supervision of high school football in Chicago: does inadequate staffing compromise healthcare? *Physician and Sports Medicine*, 32(2), 37-40.

Tropp, H., Alaranta, H., & Renstrom, P.A.F.H. (1993). Proprioception and coordination training in injury prevention. In P.A.F.H. Renström (Ed.), *Sports injuries, Basic principles of prevention and care* (pp. 277-290). Blackwell scientific publications. Oxford.

Tropp, H., Askling, C., & Gillquist, J. (1985). Prevention of ankle sprains. *American Journal of Sports Medicine*, 13, 259-262.

Twizere, J. (2004). *Epidemiology of soccer injuries in Rwanda: a need for physiotherapy intervention*. Unpublished Masters Thesis. University of the Western Cape. Bellville.



United Nations International Children Fund. (1998). Children and women of Rwanda, A situation of social sectors. Rwanda. Unpublished.

Van Mechelen, W. Hlobil, H. and Kemper, H.C. (1992). Incidence, severity, aetiology and prevention of sports injuries: A review of concepts. *Sports Medicine*, 14(2), 82-99.

Van Mechelen, W., Hlobil, H., Kemper, H.C.G., Voorn, W.J., & De Jongh, H.R. (1993). Prevention of running injuries by warm-up, cool-down, and stretching exercises. *American Journal of Sports Medicine*, 21(5), 711-719.

Waldén, M., Hägglund, M., & Ekstrand, J. (2005a). UEFA Champions League Study: a prospective study of injuries in professional football during 2001-2002 seasons. *British Journal of Sports Medicine*, 39(8), 542-546.

Waldén, M., Hägglund, M., & Ekstrand, J. (2005b). Injuries in Swedish elite football-a prospective study on injury definitions, risk for injury and injury pattern during 2001. *Scandinavian Journal of Medicine and Science in Sports*, 15, 118-125.

Weaver, J., Moore, C. K., & Howe, W. B. (1996). Injury prevention. In D. J. Caine, C. G. Caine, & K. J. Lindner (Eds.), *Epidemiology of sports injuries*. Champaign: Human Kinetics.

Wedderkopp, N., Kaltoft, M., Lundgaard, B., Rosendahl, M., & Froberg, K. (1999). Prevention of injuries in young female players in European team handball. A prospective intervention study. *Scandinavian Journal of Medicine and Science in Sports*, 9, 41-47.

Willems, T.M., Witvrouw, E., Delbaere, K., Mahieu, N., De Bourdeaudhuij, I., & De Clercq, D. (2005). Intrinsic risk factors for inversion ankle sprains in male subjects: a prospective study. *American Journal of Sports Medicine*, 33(3), 415-23.

Williams, C. (1994). Nutritional aspects. In B. Ekblom (Ed.), *Football (Soccer)* (pp. 139-157), Blackwell Scientific Publications. Oxford.

Wong, P., & Hong, Y. (2005). Soccer injury in lower extremities. *British Journal of Sports Medicine*, 39(8), 473-482.

World Health Organisation (WHO) (2005). The Ottawa charter for health promotion. First International Conference on Health Promotion, Ottawa, 21 November 1986. Retrieved July 21, 2008, at 01:17 on <http://www.crrps.org/download/OttawaCharter.pdf>

Yeung, E.W., & Yeung, S.S. (2001). Intervention for preventing soft-tissue injuries in runners. *Cochrane Database of Systematic Reviews*. 3: DC 001256.

Yoon, Y.S., Chai, M., & Shin, D.W. (2004). Football injuries during Asian tournaments. *American Journal of Sports Medicine*, 32(Suppl. 1), 36-44.





## QUESTIONNAIRE FOR SOCCER PLAYERS

All questions are strictly confidential. Please be as truthful as possible and tick one box per question unless otherwise indicated.

### Part A. IDENTIFICATION

1. Age: \_\_\_\_\_

2. Playing position:

a. Goalkeeper

b. Defender

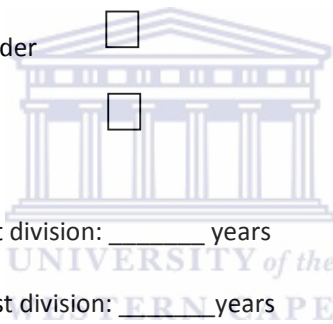
c. Midfielder

d. Striker

3. Number of years in the first division: \_\_\_\_\_ years

4. Number of years before first division: \_\_\_\_\_ years

5. Number of years in your current team: \_\_\_\_\_ years



## Part B. IMPLEMENTATION OF INJURY PREVENTION STRATEGIES

<b>1. In training, how often do you wear</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
Shin guards without ankle protection					
Shin guards with ankle protection					
Ankle protection					
Appropriate footwear/shoe					
Mouthguard					
Headgear					
Gloves for goal keepers					
<b>2. In competition, how often do you wear</b>					
Shin guards without ankle protection					
Shin guards with ankle protection					
Ankle protection					
Appropriate footwear/shoe					
Mouthguard					
Headgear					
Gloves					
<b>3. Do you have a warm up period prior to</b>					
Training					
Competition					
<b>4. In your warm up period, do you include activities like</b>					
Light aerobic activities					
Sprinting					
Jumping					
Short/long passes					
Dribbling					
Shooting/stop shooting					
<b>5. How long is your warm up programme prior to</b>	<b>5min</b>	<b>10min</b>	<b>20min</b>	<b>25min</b>	<b>30min</b>
Training					
Competition					
<b>6. Do you have a cool-down period at the completion of</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
Training					
Competition					
<b>7. In your cool down period, do you include activities like</b>					
Light jogging					
Light calisthenics					
<b>8.. How long is your cool down programme prior to</b>	<b>5min</b>	<b>10min</b>	<b>20min</b>	<b>25min</b>	<b>30min</b>
Training					
Competition					
<b>9. Do you stretch the major leg muscles in the following situations?</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
warming up prior to training					
warming up prior to matches					
cooling down after training					
cooling down after matches					



<b>10. During stretching, do you:</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
Make sure the muscles are warm first					
Slowly stretch the muscle to the point of tension					
Bounce in the stretch					
	<b>5sec</b>	<b>10sec</b>	<b>15sec</b>	<b>20 sec</b>	<b>25sec</b>
<b>11. Do you hold the stretch for at least</b>					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>12. How many times do you repeat the stretch per muscle on both sides of the body</b>					
<b>13. How many times per week do you undertake strength training</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
as part of team session					
as extra individual work					
<b>14. Do you consciously consume carbohydrates (e. g: bread, pasta, rice, potatoes, chocolate, sugar) in the following situations?</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
pre-training					
post-training					
pre-match					
post-match					
<b>15. Prior to training, Do you drink water</b>	<b>Yes</b>	<b>No</b>			
Before					
During					
After					
<b>16. Prior to competition Do you drink water</b>	<b>Yes</b>	<b>No</b>			
Before					
During					
After					

**Part C: FACTORS INFLUENCING IMPLEMENTATION OF INJURY PREVENTION STRATEGIES**

If you do not undertake the following activities indicate all the reasons why not.

- Strength training at least once per week
- Flexibility training at least once per week
- warm up always before training and matches
- cool down always after training and matches

	Strength training	Flexibility training	Warm ups		Cool downs	
			training	competition	training	competition
1. not enough time						
2. too tired after training/ match						
3. are not given advice on techniques						
4. do not believe it is necessary						
5. no body else does it						
6. lack of proper equipments						
7. other (please specify)						



**Part D: FACTORS INFLUENCING KNOWLEDGE OF INJURY PREVENTION**

Where did you learn about injury prevention?

Please rank these sources of information in order of importance - from most important to least important.

Source of knowledge	Most important	Important	Least important
Coach			
Doctor/ physiotherapist			
Media			

**Part E. INJURY PREVENTION KNOWLEDGE**

In the following question tick the description which most closely matches your opinion of the statement

	Strongly agree	agree	neither agree Nor disagree	disagree	Strongly disagree
1. The chance of sustaining an injury during training that prevents you from being available for selection is likely to happen.					
2. The chances for sustaining an injury during a competitive match that prevents you from being available for selection is likely to happen.					
3. There is a greater chance of sustaining an injury during a competitive match than during training.					
4. Injuries are a consequence of the action of another player.					
5. The risk of lower leg injuries in training is reduced by wearing shin guards.					
6. Injury is more likely towards the end of a match.					
7. The risk of injury is reduced by thoroughly warming up and stretching prior to training or competition					
8. The risk of injury is reduced by thoroughly cooling down and stretching after training or competition					
9. Players with poor flexibility are more likely to get injured than those with good flexibility.					
10. Strong muscles are important in the protection against injuries.					
11. The majority of other players wear shin guards during training.					

**Thank you for helping us**

## QUESTIONNAIRE FOR TEAM COACHES

All questions are strictly confidential. Please be as truthful as possible and tick one box per question unless otherwise indicated.

### Part A. IDENTIFICATION

1. Age: \_\_\_\_\_
2. Number of years in coaching: \_\_\_\_\_ years
3. Number of year in the first division: \_\_\_\_\_ years
4. Number of years in the current team: \_\_\_\_\_ years

### Part B: FACTORS INFLUENCING KNOWLEDGE OF INJURY PREVENTION

Where did you learn about injury prevention?

Please rank these sources of information in order of importance - from most important to least important.

Source of knowledge	Most important	Important	Least important
Doctor/ physiotherapist			
Media			
Seminars			

## Part C. IMPLEMENTATION OF INJURY PREVENTION STRATEGIES

**Tick one box per question**

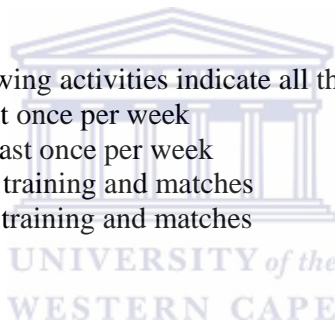
<b>1. Do you supervise warm up sessions prior to</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
training					
competition					
<b>2. In your warm up programme, do you include activities like</b>					
Light aerobic activities					
Sprinting					
Jumping					
Short/long passes					
Dribbling					
Shooting/stop shooting					
Stretching					
<b>3. How long is your warm up programme prior to</b>	<b>5min</b>	<b>10min</b>	<b>20min</b>	<b>25min</b>	<b>30min</b>
Training					
Competition					
<b>4. How often do you supervise a cool-down period at the completion of</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
Training					
Competition					
<b>5. In your cool down programme, do you include activities like</b>					
Light jogging					
Light calisthenics					
Stretching					
<b>6. How long is your cool down programme prior to</b>	<b>5min</b>	<b>10min</b>	<b>20min</b>	<b>25min</b>	<b>30min</b>
Training					
Competition					
<b>7. The preseason training starts</b>	<b>2weeks</b>	<b>3weeks</b>	<b>4weeks</b>	<b>5weeks</b>	<b>5weeks</b>
Time					
<b>8. In your training plan, do you</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
Balance of fitness and skill development					
Gradually increase in intensity					
Teach players to be aware of their training					
Note players' changes in skill levels and techniques					
Modify training according to the playing field					
Modify training according to the weather					
<b>9. Do you supervise stretching sessions prior to</b>					
training					
Matches					

10. During the stretching sessions, do you	Always	very often	Often	sometimes	never
Demonstrate the skill to the player					
Explain the skill to the player					
Pay attention to the player practicing the skill					
11. Do you ensure that equipments are					
Available and used by players					
Appropriate					
High quality					
In good condition					
Sized properly					
Fitted correctly					
Maintained					
Repaired or replaced when damaged					

**Part D: FACTORS INFLUENCING IMPLEMENTATION OF INJURY PREVENTION STRATEGIES**

If you do not supervise the following activities indicate all the reasons why not.

- Strength training at least once per week
- Flexibility training at least once per week
- warm up always before training and matches
- cool down always after training and matches



	Strength training	Flexibility training	Warm ups		Cool downs	
			training	competition	training	competition
1.not enough time						
2.too tired after training/ match						
3.are not given advice on techniques						
4.do not believe it is necessary						
5.Other coaches do not do it/ No body else does it						
6.lack of proper equipments						
7.other (please specify)						

**Part E. INJURY PREVENTION KNOWLEDGE**

In the following question tick the description which most closely matches your opinion of the statement

	Strongly agree	agree	neither agree Nor disagree	disagree	Strongly disagree
1. The chance of sustaining an injury during training that prevents a player from being available for selection is likely to happen.					
2. The chances for sustaining an injury during a competitive match that prevents a player from being available for selection is likely to happen.					
3. There is a greater chance of sustaining an injury during a competitive match than during training.					
4. Injuries are a consequence of the action of another player.					
5. The risk of lower leg injuries in training is reduced by wearing shin guards.					
6. Injury is more likely towards the end of a match.					
7. The risk of injury is reduced by thoroughly warming up and stretching prior to training or competition					
8. The risk of injury is reduced by thoroughly cooling down and stretching after training or competition					
9. Players with poor flexibility are more likely to get injured than those with good flexibility.					
10. Strong muscles are important in the protection against injuries.					
11. The majority of my players wear shin guards during training.					

**Thank you for helping us**

## QUESTIONNAIRE FOR TEAM MEDICAL PERSONNEL

WHEN COMPLETING THE QUESTIONNAIRE, PLEASE TICK THE BOX THAT REPRESENTS THE SITUATION AT YOUR CLUB, UNLESS THE INSTRUCTIONS INDICATE TO TICK ALL APPROPRIATE BOXES.

### Part A. IDENTIFICATION

1. Are you:

Medical doctor	
Nurse	
Physiotherapist	
First aider	
Redcross agent	
Other (specify)	

2. Number of year in your club: \_\_\_\_\_ years
3. Years of experience in your qualification: \_\_\_\_\_ years
4. Years of experience in soccer: \_\_\_\_\_ years.



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## Part B: SPORT SAFETY PRACTICE

The following questions seek to identify the actual safety **practices** currently in place at your **Club** during competition and training.

<b>HOW FREQUENT</b>	<b>Always</b>	<b>very often</b>	<b>Often</b>	<b>sometimes</b>	<b>never</b>
1. Is your attendance during training?					
2. Is your attendance during competition?					
3. Is appropriate First Aid equipment readily available at training?					
4. Is appropriate First Aid equipment readily available at competition?					
5. Is a telephone available in case of emergency at training?					
6. Is a telephone available in case of emergency at competition?					
7. Does your Club ensure access for ambulance and emergency service vehicles to the facilities during training?					
8. Does your Club ensure access for ambulance and emergency service vehicles to the facilities during competition?					
9. Are your playing grounds generally in safe playing condition?					
10. Are fixtures and fittings within playing fields made safe for players (e.g. goalpost padding, collapsible corner posts/flags) at training?					
11. Are fixtures and fittings within playing fields made safe for players (e.g. goalpost padding, collapsible corner posts/flags) at competition?					
12. Do players personal equipment items checked by someone in authority prior to training?					
13. Do players personal equipment items checked by someone in authority prior to competition?					
14. Does your Club ensure that drinking water/fluid is available at training?					
15. Does your Club ensure that drinking water/fluid is available at competition?					
16. Do you encourage players to drink more frequently during training?					
17. Do you encourage players to drink more frequently during competition?					
18. Is the injury preventing one of the target of training or coaching? (e.g. safe tackling, safe landing techniques)?					

<b>HOW OFTEN</b>	<b>Yes</b>	<b>No</b>
19. Do you encourage players to warm up prior to training?		
20. Do you encourage players to warm up prior to competition?		
21. Do you encourage players to cool down at the completion of training?		
22. Do you encourage players to cool down at the completion of competition?		
23. Do you encourage players to stretch their muscles during training?		
24. Do you encourage players to stretch their muscles during competition?		
25. Do you encourage players to seek for treatment?		



**Thank you for helping us**

## QUESTIONNAIRE FOR TEAM LEADER

WHEN COMPLETING THE QUESTIONNAIRE, PLEASE TICK THE BOX THAT REPRESENTS THE SITUATION AT YOUR CLUB, UNLESS THE INSTRUCTIONS INDICATE TO TICK ALL APPROPRIATE BOXES.

### Part A. IDENTIFICATION

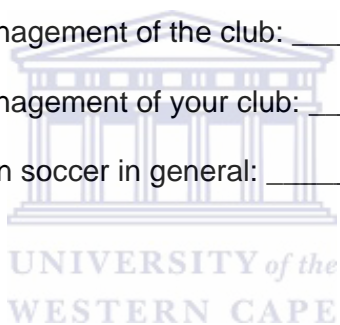
1. Your primary position in the team:

President	
Secretary	
Treasurer	
Team manager	
Other (specify)	

2. Number of years in the management of the club: \_\_\_\_\_ years

3. Number of years in the management of your club: \_\_\_\_\_ years

4. Number of years involved in soccer in general: \_\_\_\_\_ years



## Part B: SPORT SAFETY POLICY

The following questions seek to identify your **Club's policy** with regard to a range of safety issues.

For the purposes of this questionnaire, “policy” is defined as a specified plan, strategy, guiding principle or statement of procedure. Your policies may be written or unwritten but it is expected that they form part of the general rules by which your Club operates.

Is there in your club	YES	NO	I DON'T KNOW
1. A comprehensive Sport Safety/Risk management policy to address all aspects of injury prevention?			
2. An Emergency Action policy in the event of severe injury?			
3. A pre-participation health screening policy for players?			
4. A policy on attendance of medical practitioners at competition?			
5. A policy on attendance of medical practitioners at training?			
6. A policy on safety inspection of playing surfaces before competition?			
7. A policy on safety inspection of playing surfaces before training?			
8. A policy on the wearing and use of protective equipment during competition?			
9. A policy on the wearing and use of protective equipment during training?			
10. A policy on the participation of players at competition or training under the influence of alcohol or other drugs?			
11. A Code of Conduct/Fair play policy for players?			
12. A Code of Conduct on the acceptable behavior of people attending competition? (coaches, officials, spectators)			
13. Does your club have a formal sport insurance policy?			
14. Is insurance compulsory at your club?			
15. Does your club have a specific Safety budget?			
16. Does your club have a committee/coordinator specifically responsible for safety?			
17. Are the sport safety policies regularly reviewed (if present)?			

18. In general, how well informed do you think your club stakeholders are about the safety policies in place at your club?

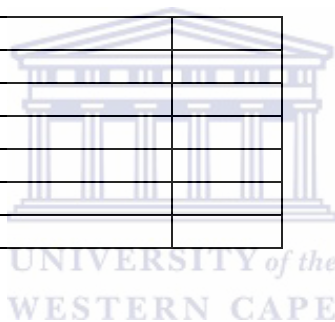
	Poor	medium	Very well
Administrators			
Coaches			
Players			
Medical professional			

19. Would your club like?

	Yes	No
Access to more safety and training programs?		
Assistance to develop a Sports Safety Program?		

20. Who do you think should be actively supporting your Club in implementing safety practices and policies? (tick appropriate boxes)

Federal sports body	
Local Council	
State sports body	
Sponsors	
Association	
Medical professional	
Club members/players	



### Part C: FACTORS INFLUENCING KNOWLEDGE OF INJURY PREVENTION

Where did you learn about injury prevention?

Please rank these sources in order of importance - from most important to least important.

Source of knowledge	Most important	Important	Least important
Doctor/ physiotherapist			
Media			
Seminars			

### Part D. INJURY PREVENTION KNOWLEDGE

In the following question tick the description which most closely matches your opinion of the statement

	Strongly agree	agree	neither agree Nor disagree	disagree	Strongly disagree
1. The chance of sustaining an injury during training that prevents a player from being available for selection is likely to happen.					
2. The chances for sustaining an injury during a competitive match that prevents a player from being available for selection is likely to happen.					
3. There is a greater chance of sustaining an injury during a competitive match than during training.					
4. Injuries are a consequence of the action of another player.					
5. The risk of lower leg injuries in training is reduced by wearing shin guards.					
6. Injury is more likely towards the end of a match.					
7. The risk of injury is reduced by thoroughly warming up and stretching prior to training or competition					
8. The risk of injury is reduced by thoroughly cooling down and stretching after training or competition					
9. Players with poor flexibility are more likely to get injured than those with good flexibility.					
10. Strong muscles are important in the protection against injuries.					
11. The majority of players in my club wear shin guards during training.					

**Thank you for helping us**