

# Injury Prevention Practices by Amateur Football Coaches in Gauteng South Africa

Siphesihle Mtshali<sup>1</sup>, Hellen Myezwa<sup>1</sup>, Nonceba Mbambo-Kekana<sup>2</sup> and Kerith Aginsky<sup>1</sup>

<sup>1</sup>Faculty of Health Sciences, University of the Witwatersrand, 7 York Road Parktown, Johannesburg, South Africa

<sup>2</sup>School of Health Sciences, University of Limpopo, Polokwane, South Africa

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**Abstract:** Football coaches play a vital role in teaching safe playing skills and prevention strategies. However with perceived incongruence between existing scientific evidence, research and implementation in practice and delivery, there is no evidence for translation of research into practice. This study aimed to identify coaching practices on injury prevention in amateur football players. Ten institutions and their coaches registered in the University Sport of South Africa Gauteng Football League during the 2012 season agreed to participate in the study. A structured observation checklist was developed from the ten point action plan of the SportSmart injury prevention programme to observe practices of coaches. The coaches' education was found to be limited to an introductory level and experience. Keeping attendance registers, type of stretches during warm up, availability of hydration and injury management during training sessions were aspects not practised by the coaches. This paper presents aspects the coaches were focusing on, which may influence injury prevention. Sixty percent of the items in the observation checklist were not taken into account by the majority of coaches. Some of the omissions such as type of stretches have the potential to increase the risk of injury among the players.

## 1 INTRODUCTION

For an effective injury prevention programme, it is important to determine the pre-existing knowledge and practice of coaches. In order to determine pre-existing knowledge and practices most studies use questionnaires and interviews. In social sciences direct observation methods are used to determine practices or behaviour of participants. There are various observational methods which include explorative, detailed, and inquisitive and comparison. However in coaching, systemic observation has been used to identify the behaviour of coaches and teachers in sport and education (Cushion et al., 2012a). The observation of coaches has resulted in a wealth of information about coach behaviour, observation instruments used in the process and areas of improvement in coaching (Cushion et al., 2012a). The focus of observations is on general coach behaviour in order to implement interventions that aim on improving interactions in specific areas of coaching practice. Various observation tools have been developed to capture complex coaching behaviour and practice (Cushion

et al., 2012b, Ford et al., 2009). These tools are specific to behaviour in terms of pre delivery planning, safety, personal qualities and a general coaching approach, organization of the session, instruction, communication, observation and feedback. Some of these observation tools also provide self-awareness feedback to coaches in aligning the actual and stated behaviour (Cushion et al., 2012b, Ford et al., 2010a). Although there is a safety component in the observation checklist, the details do not encompass injury prevention strategies.

Coaching observation has been used to examine coaches' practices and instructional (Ford et al., 2010b) behaviour for football players using video analysis and checklist in terms of skill acquisition, motor learning and expert performance. The observation method has also been used in coaches' evaluation of practices, but not in the application of injury prevention practices. There are few studies that have evaluated coaches' behavioural changes and adherence following an intervention, that also used the observation approach to establish the teams adherence to the intervention (Steffen et al., 2013a).

In the above study coaches were not aware that observation was taking place during practice and there are no further details on the nature of the observation. However, coaches' behavioural changes and implementation of injury prevention programmes has been mainly determined through self-reported questionnaires with no practical observation (Gianotti et al., 2010). As most self-reported questionnaires rely on participants' responses and therefore may not reflect the true practical implementation of injury prevention programmes.

There is a perceived incongruence or mismatch between existing scientific evidence, research and implementation in practice and delivery in sport research (Ford et al., 2010a, Donaldson and Finch, 2013, Finch et al., 2013). In football there is still no evidence as to whether coaches practically implement the existing scientific evidence in injury prevention. Some of the reasons for the lack of implementation could be the lack of consensus on injury prevention strategies and programmes by researchers which affects the dissemination. The aim of this study was to identify the practices of coaches of amateur football players to assist in the development of a coach education injury prevention programme.

## 2 METHODS

Observation of injury prevention practices was used to determine baseline information on coaches in order to develop a coach education programme on injury prevention in amateur football players. Permission to conduct the study was obtained from the University of the Witwatersrand Human Research Ethics Committee (M110654) and University Sport of South Africa Football. The study was conducted in the Gauteng Province of South Africa in university institutions that participated in the University Sport South Africa Gauteng Football League (UGFL) during the 2012 season. All twelve UGFL participating institutions were invited to participate in the study.

Training days were identified with each institution and appointments were made with the head coaches through the team managers. A total of two structured observations of training sessions were done with each team. Consent for the study was sought from the head coach. Full training sessions were observed using the structured observation checklist and notes were made for better

understanding where necessary. The observation of practices was conducted over a period of six weeks during the first half of the league season. Clarification on specific training aspects included the type of skills or fitness training for an example ball handling skills, kicking skills, game set plays, changing direction, endurance and resistance training.

The structured observation checklist was developed using the 10-point action plan of injury prevention by Gianotti and Hume (2007). The 10-point action plan includes 1) screening, 2) warm up – cool down and stretching, 3) physical conditioning, 4) technique, 5) fair play, 6) protective equipment, 7) hydration and nutrition, 8) injury reporting, 9) environment and 10) injury management which was developed as part of the SportSmart programme (Gianotti and Hume, 2007). The checklist was piloted for feasibility and content validity using teams from four provinces of South Africa (Mpumalanga, Western Cape, Free State and Northwest Provinces) during the University Sport of South Africa football national championships in 2011. This was done over a five day football tournament and adjustments were made. The injury prevention structured observation checklist has the following items: injury reporting, training (warm up, cool down, stretching, skills, fitness), equipment (use of shin guards, soccer boots), nutrition and hydration, environmental factors (weather, playing surfaces), injury management (availability of first aid, availability of medical personnel, injury protocol). A focus group of four coaches, two players, medical doctor and a physiotherapist expert on questionnaire development were given the list to use during the first two days of the tournament. It was adjusted and edited as per suggestions and consensus was reached within the group ( $r = 0.98$ ). Fair play on the item list was removed as it required more details and engagement with coaches and referees to reach conclusions which were beyond the objective of the study. Basic demographics of the coaches were determined which included level of coaches training. Descriptive analysis using frequencies, percentages, means and standard deviations were used in this study.

## 3 RESULTS

Ten of the twelve institutions agreed to participate in the study and coaches were observed during their training and match sessions. Twelve coaches completed the demographic questionnaire. As the

sample of the coaches was small, age ranges were used instead of the actual age. Fifty eight percent of the coaches were in the range of 30 – 39 age and seventy five percent of the sample were males. In South Africa official coaching education has four levels: introductory level, level one, two and three. Seventeen percent of the coaches did not have any coaching education compared to 50% that had introductory level. Two thirds of the sample were head coaches and had been in the position between two to five years. Majority (75%) gained their football experience as players and the rest of the coaches gained their experience as referees (17%), managers of the teams (8%) and team trainers (8%). Football coaching experience was gained from coaching a junior team (42%), amateur club (42%), school level (8%) and 8% had no coaching experience.

### 3.1 Training Sessions

A standard question to all the coaches at the beginning of the training session was asked, “Are all your players here today?” Three coaches of the 10 teams knew the number of players attending the training sessions and explanation for the absent players was given. Seven coaches were not sure of the whereabouts of their players and one of them did not even recognise some of the players during the training session. The number of players attending the training session was compared to the number of official registered players per team.

### 3.2 Duration of Training Sessions

Although the focus of the training session varied between fitness and skills training with each team, all the teams included both types of training on the days of observation. Teams were observed for the length of training. Total duration was determined by calculating the length of time taken for the warm up, skills and fitness during training session. The average duration of skills training amongst all the teams was  $38 \pm 6.12$  minutes whereas time spent on fitness training was on average  $20 \pm 7.32$  minutes. The average total duration of training per session was  $75 \pm 15.58$  minutes. The average duration for warm up was  $19 \pm 9.72$  minutes with the least amount of time being 10 minutes.

### 3.3 Considered Factors during Training

Injury management (80%), hydration (70%) and

cool down (80%) were not highly considered factors by the coaches during their training sessions. Even though 60% of the coaches considered stretching as part of the training session; 40% of the stretching teams focused more on static stretching. There was 100% use of appropriate football shoes/boots by players in all the teams, though not all the players in the teams wore shin guards. Coaches did not take any action for who did not have shin guards. At the time of observation none of the players in the teams were using visible taping or bracing during training. During the training session, nine teams (60%) completed a warm up routine. Two teams included paced running around the field once or twice for the cool down. Hydration in the form of water bottles or nearby water taps was not fully available during training but available during matches where all teams had hydration for players on the side line.

### 3.4 Environment Factors

#### 3.4.1 Playing Surface

All observed training sessions were done outdoors in the afternoon to early evening sessions (16h00 – 19h00) and all participating teams played on natural turf. The majority of the teams (80%) trained on patchy surfaces. Patchy surfaces or fields were defined as the surfaces where the grass was not evenly green and did not consistently cover the whole field.

#### 3.4.2 Weather Conditions

The average temperature when the training sessions occurred was  $18.2 \pm 1.41$  degrees Celsius for all the teams observed. There was no time adjustment for cool weather conditions during training sessions.

### 3.5 Injury Management

Only one team had an injury management protocol which included what happens when a player gets injured on the field, during rehabilitation and appropriate recording or reporting of injuries. Players in the team with injury management protocol who were undergoing rehabilitation and were ready to return to play participated in individualised training sessions. Two of the teams had students who were studying health or exercise science degrees assisting the team with medical care that included providing first aid care.

## 4 DISCUSSION

### 4.1 Attendance of Training and Match Sessions

Seventy percent of the coaches were not able to account for non-attendance or extra players in the team thus indicating that coaches did not maintain an attendance register for the training sessions. Attendance of players and keeping of registers has been reported in studies evaluating adherence or compliance to the intervention programme in the injury prevention studies (Sugimoto et al., 2012). Here players with low compliance rate were 4.9 times more at risk of ACL injury compared to those players with high compliance to assess the effect compliance to neuromusculoskeletal training for the anterior cruciate ligament. Attending and completing training sessions was used to determine the compliance of players to the ACL intervention programme. Players with high compliance to an intervention programme have a lower risk of injury (Soligard et al. (2010), Steffen et al. (2013b) and (Steffen et al., 2008). To be able to report on compliance to the intervention programmes in these studies, coaches had to report on players present during training sessions. Coaches' compliance and attitude toward the intervention programmes was a predictor of injury risk (Soligard et al., 2010). Failure to attend training sessions and poor record keeping could increase the risk of injury among these amateur players as they are missing football skills development and conditioning.

### 4.2 Warm up

Except for one team, teams performed an active warm up routine during training sessions and pre match warm up routine. Warm up before training or performance in physical activity is physiologically and psychologically important to prepare players for improved performance, reduce risk of injuries (Bishop, 2003). With increased core body temperature there is reduced viscosity to muscles and joints and increased oxygen release and delivery. Warm up increases blood circulation to the working muscles and thus increases temperature. Baseline oxygen consumption ( $VO_2$ ) is elevated decreasing the initial oxygen deficit which preserves more anaerobic capacity for the task (Bishop, 2003, Towlson et al., 2013). The inclusion of warm up by the majority of the teams is a positive finding from this study. However, the actual impact of the warm up programmes on injury prevention needs further

investigating. The appropriate duration for warm also need further investigation as there is no consensus from football research. There are mixed findings on the effect of a longer duration of warm up, particularly for pre matches, on performance and risk of being injured (Zois et al., 2011, Towlson et al., 2013).

The average pre-match warm up duration in this study was  $28 \pm 5.72$  minutes which is about ten minutes longer than the recommended minutes (Soligard et al., 2008). Warm up of more than 25 minutes has been found to have a negative influence on performance as it may induce fatigue (Zois et al., 2011) and deplete energy stores (Gregson et al., 2005). However their finding and the finding in this study is in contradiction to Zois et al. (2011) who found that longer duration of pre match warm up had no influence on performance. About 90% of the teams went through a warm up routine during training sessions which lasted for an average of  $19 \pm 9.72$  minutes. The pre-training warm up routine for this study is within the ranges of the FIFA 11+ comprehensive warm up programme which is 15 – 20 minutes. Though the teams engaged in pre-training warm up, four of the nine teams did not have a structured warm up that covers the basic components required for football training. The basic components of pre-training warm up include but not limited to ball handling, kicking skills, sprinting, football drills and endurance training (Lees and Nolan, 1998). This is despite evidence that structured warm up routines reduce the risk of injury (Soligard et al., 2010, Steffen et al., 2013a).

### 4.3 Stretches (Pre Participation)

Sixty percent of the teams included stretching during the warm up routine and 40% did pre-participation static stretching. Pre participation regular stretching reduces the risk of muscle tendinous injuries and improves performance when combined with dynamic drills (McHugh and Cosgrave, 2010, Shrier, 2004). However, static stretching has been found to reduce acute muscle performance up to an hour following the stretch and is therefore not recommended pre-participation. It is recommended that players engage in dynamic stretching pre-participation (Fattahi-Bafghi and Amiri-Khorasani (2013). The stretching regiment being done in this cohort was found to be inappropriate as static stretching was done prior to exercise and after warm up which has been found to reduce performance and strength (Fowles et al., 2000). Static stretching routine combined with dynamic activities (Fattahi-

Bafghi and Amiri-Khorasani, 2013) prior to training session should be advocated to reduce the risk of muscle injuries (Jamtvedt et al., 2010).

#### 4.4 Cool down and Post Participation

Static stretching together with cold water immersion, compression garments, rehydration and energy refuelling are considered as the standard basic activities to facilitate recovery post exercise (Montgomery et al., 2008). In this study, only two teams performed static stretching post training. Although outcomes on post activity stretching are inconclusive (Jamtvedt et al., 2010, Herbert and Gabriel, 2002), there is conflicting evidence that it may reduce muscle soreness and assist in recovery of muscles (Ne'de'lec et al., 2013).

#### 4.5 Equipment

During matches all the teams used appropriate gear for football including boots, shin guards and goalkeeper kit. However, during the training sessions 40% of the teams were not using shin guards. Mtshali et al. (2009) found that wearing of shin guards had a 65% likelihood of reducing leg injuries. The use of shin guards during training seems to be problematic in other countries as well. Owoye et al. (2013) found that only 40% of players in Nigeria wore shin guards during training. It is clear in this study that use of the shin guards during training is poor and demonstrates a lack of understanding of appropriate use of equipment in soccer to prevent injuries. The danger of sustaining injuries is just as real during training as it is during matches.

#### 4.6 Hydration

The aim of rehydrating before, during and after exercise is to maintain fluid balance and avert compromised performance from fluid loss (Shirreffs et al., 2006). Hydration enhances performance before and after exercise especially when combined with electrolytes and carbohydrates (Shirreffs et al., 2006, Sawka et al., 2007). Fluid intake in warm temperatures increases body water reserves and improves temperature regulation and does not decrease performance (Rico-Sanz et al., 1996). This study was done during the cool season (July to August) where temperatures were below 20°C. There was minimal fluid intake by the teams (30%) during training. Less fluid intake during cool weather conditions observed in this study is similar

to what was established by Maughan et al. (2005a). They established that sweat loss when training in cool conditions in a 90 minute training session was similar to that experienced when exercising in warm conditions. With sweat loss similar in warm and cool conditions, conclusions can be drawn that fluid intake when exercising in cool temperature is just as important as exercising in warm temperatures to prevent heat related injuries (Maughan et al., 2005b).

#### 4.7 Injury Management

There was 20% presence of medical care during training sessions in this study and there was only one team coach who had an injury management protocol. Health and safety protocols for players state that there should be basic medical care coverage during sporting events for players as well as spectators regardless of the level of competition (Murphy and Waddington, 2007, Almquist et al., 2008). The role of medical care coverage in teams is to provide injury prevention and rehabilitation once the injury has occurred (McLean, 1990). The lack of initial injury management may in the long run influence the team's performance due to injury, player absenteeism and poor return to play protocols (Matheson et al., 2011). It may also have cost implications where lack of proper acute management of sport injuries results in progression to chronic conditions like osteoarthritis later in life which has an impact on the health system and concerned individuals (Drawer and Fuller, 2001, Dvorak, 2011).

### 5 CONCLUSION

This study provides information on coach practices and oversight regarding injury prevention during training sessions. Sixty percent of the items in the observation list were not taken into consideration by most of the coaches during training. Items such as warm up, stretches and appropriate use of equipment were considered by most of the teams. The observations of coaches practices may assist in the development, adherence and implementation of injury prevention programmes specific to the needs identified.

#### 5.1 Implications for Prevention (Practical Implications)

Observation method can be used to evaluate

coaches' implementation of injury prevention programmes.

## 5.2 What This Study Adds

- Observation method in determining the pre-existing practices of football coaches.
- Experience as a player is the main source of knowledge for amateur coaches
- Insight on the existing gap on implementation and adherence to injury prevention evidence into practice.

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