

Sports injury prevention strategies and safety practices in place among male elite rugby football union clubs in Kenya

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Abstract. Injuries sustained to rugby players during rugby training sessions and competitions constitute a considerable risk to professional rugby union players; however, there is a shortage of detailed epidemiological information about these injuries in this population in Africa and specifically in Kenya and little has been done to minimize the incidences of these injuries specifically in Kenya. Therefore, this study was to investigate the injury prevention strategies and sports safety practices practiced among elite male rugby football clubs. **Objective.** To identify and describe various injury prevention strategies and sports safety practices in place among rugby clubs in Kenya. **Study Design.** A cross-sectional, descriptive, quantitative study design was used. Research Setting: the study was conducted in Nairobi, Kenya among seven elite male rugby teams participating in KRFU League during the 2011/2012 season; A total of 210 rugby players, seven team coaches, seven team medical practitioners and seven team managers that were part of the teams' activities during the 2011-2012 Season were approached to participate in the study. Four self-administered questionnaires were used to collect data from the participants. Pre-adapted from the Sports Safety Assessment Tool (SSAT). **Results.** There were deficiencies in the use of protective equipment, warming up and cooling down during training and matches, moreover inadequate warm-up and cool-down duration. Nevertheless, clubs did not conduct flexibility and strength training and there was no attendance of qualified Cardiopulmonary resuscitation personnel at both training and matches, while playing surfaces were not also ensured to be in good condition before matches and training, clubs did not record injuries. Clubs too did not ensure proper carbohydrate consumption by players prior to and after matches and training. Majority of the clubs implemented more sport safety practices during matches than training and none of the clubs had these written sports safety practices and policies in place. **Conclusion.** Therefore, there is a need to translate of the latest scientific evidence about effective injury prevention into coaching practices and this should be brought under the attention of team management. Moreover, clubs should elect a sports safety committee to ensure that sports safety practices and policies are developed and implemented in future as they have been proved to play a significant role in sports injury prevention.

Keywords: implementation, injury prevention strategies, sport safety practices & policies.

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Стратегии предотвращения спортивных травм и меры безопасности, применяемые в элитных мужских клубах по регби в Кении

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Аннотация. Травмы, получаемые игроками в регби во время тренировок и соревнований, представляют значительный риск для профессиональных регбистов. Однако подробной эпидемиологической информации об этих травмах среди игроков в регби в Африке и, в частности, в Кении недостаточно, и мало что делается для снижения количества таких травм в Кении. Таким образом, целью данного исследования было изучение стратегий предотвращения травм и мер по обеспечению безопасности в спорте, применяемых в элитных мужских регбийных клубах. Цель. Выявить и описать различные стратегии предотвращения травм и меры по обеспечению безопасности в спорте, применяемые в регбийных клубах Кении. **Материалы и методы исследования.** Проведено поперечное описательное количественное исследование. Место проведения исследования - Исследование проводилось в Найроби, Кения, среди семи элитных мужских регбийных команд, участвовавших в Лиге Кенийской федерации регби в сезоне 2011/2012. К участию в исследовании были приглашены 210 регбистов, семь тренеров команд, семь спортивных врачей и семь менеджеров команд, которые принимали участие в деятельности команд в сезоне 2011–2012. Для сбора данных от участников использовались четыре опросника, которые они заполняли самостоятельно. Опросники были адаптированы на основе инструмента оценки безопасности в спорте (Sports Safety Assessment Tool, SSAT). **Результаты.** Были выявлены недостатки в использовании средств защиты, разминки и заминки во время тренировок и матчей, а также недостаточная продолжительность разминки и заминки. Тем не менее, клубы не проводили тренировки на растяжку и силовые тренировки, а квалифицированные специалисты по сердечно-легочной реанимации не присутствовали ни на тренировках, ни на матчах. Кроме того, не проверялось состояние игровых покрытий перед матчами и тренировками, а травмы не фиксировались. Клубы также не обеспечивали игрокам достаточное потребление углеводов до и после матчей и тренировок. Большинство клубов уделяли больше внимания мерам по обеспечению безопасности во время матчей, чем во время тренировок, и ни в одном из клубов не было разработанных и внедренных правил и регламентов по обеспечению безопасности. **Выводы.** Необходимо внедрять в тренерскую практику новейшие научные данные об эффективных методах профилактики травматизма, и на это следует обратить внимание руководства команд. Кроме того, клубам следует создать комитет по обеспечению безопасности, чтобы разрабатывать и внедрять меры и регламенты по обеспечению безопасности, поскольку доказано, что они играют важную роль в профилактике спортивных травм.

Ключевые слова: внедрение, стратегии профилактики травматизма, меры и регламенты по обеспечению безопасности в спорте.

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Background

Several researchers have recommended different strategies to help minimize and prevent sports injuries in different sports (Brukner & Khan, 2003). For instance, injury prevention in rugby is based on training, equipment, technique, player conditioning, environment, playing surface and officials. Moreover, prevention strategies like warm-up, stretching, use of protective equipment, cool-down and adequate rehabilitation has been found effective to minimize injury risk (Junge & Dvorac, 2004). Furthermore, other studies have reported that implementation of these injury prevention strategies can drastically reduce the incidences of rugby injuries.

Coaching on defensive skills, correct tackling technique and correct landing may help minimize risk of sustaining injury during tackling (Saunders, Otago, Romiti, Donaldson, White & Finch, 2010; Carter & Muller, 2008) and promoting sports injuries awareness among players and coaches (Quarrie, Gianotti, Hopkins & Hume, 2007) have been found efficient in minimizing injuries. However, to date very little injury prevention programmes have been widely implemented (Myklebust et al., 2003). Nevertheless, developed countries such as New Zealand have implemented successful rugby injury prevention strategies. For instance, ACC Sport Smart, a 10-point action plan, has been successfully implemented in New Zealand for sports injury prevention.

In Africa not much has been done to implement these rugby injury prevention strategies. However, South Africa, one of the power houses of rugby in Africa, has not been left behind in implementation of rugby injury prevention programmes. South Africa has successfully implemented one of the best practice rugby injury prevention programme known as "Bok Smart".

BokSmart National Rugby Safety Programme provides coaches, referees and their assistants and players knowledge and skills to enable them play safe rugby in South Africa (BokSmart, 2012). In Kenya not much has been done to implement these rugby injury prevention strategies compared to other developed countries. This could be an important reason why rugby injuries still exist (personal communication).

Compliance to these injury prevention strategies has been not easy to execute as it is difficult for coaches to apply these strategies to prevent injuries unless a benefit such as improved performance is involved (Myklebust et al., 2003). In addition, another reason for non-implementation of these preventative measures is because putting scientific research into practice has been proved to be challenging (Klügl et al., 2010). In addition, lack

of implementation studies must have broadened the gap between knowledge of best preventative programmes and the capability to efficaciously employ these strategies (Stasinopoulos, 2004). Nevertheless, lack of well-designed, result oriented research has made it difficult to conception and execution these injury preventative measures in really life context (Bishop, 2008).

Moreover, few studies have been done in this area of implementation of rugby injury prevention strategies (Casey, Finch, Mahoney & Townsend, 2004). However, the few studies conducted in this area such as the one by Casey et al. (2004) investigating the factors influencing sports safety policies and practice; lack of qualified personnel (referees, trainers and medical personnel) and financial constraints have been observed. In addition, Hawkins and Fuller (1998) reported fatigue, lack of advice and time as the main factors slowing down the effort implement these preventative measures. These factors and many more others may have had an impact on the implementation of rugby injury preventative measures in Kenya and maybe they are the hindering factors to sports injury prevention in Kenya. Therefore, this study investigated and identified different injury prevention strategies and sports safety practices in place among seven elite male rugby clubs in Kenya during the 2011-2012 KRFU Season.

Methods

Research Setting. The study was conducted in Nairobi, Kenya. Nairobi is the capital city of Kenya located in the Central South of Kenya. Kenya Rugby Football Union (KRFU) is the body which governs rugby in Kenya and is a member of the International Rugby Board (IRB) and is based in Nairobi. Seven first division clubs participate in Nairobi in the KRFU league and are run at a semi-professional level.

Objective. To identify and describe various injury prevention strategies and sports safety practices in place among rugby clubs in Kenya.

Study Design: A cross-sectional, descriptive, quantitative study design was used. **Research Setting:** The study was conducted in Nairobi, Kenya among seven elite male rugby teams participating in KRFU League during the 2011/2012 season; A total of 210 rugby players, 7 team coaches, 7 team medical practitioners and 7 team managers that were part of the teams' activities during the 2011-2012 Season were thus invited / approached to participate in the study.

Instruments. The questionnaires for rugby players and team coaches assessed injury prevention strategies and safety practices in place in their current teams and the activities undertaken (Hawkins &

Fuller, 1998), this included questions on the use of protective equipment such as headgears, ankle braces, appropriate shoes and other common injury prevention strategies such as warm-up, cool-down, stretching, flexibility and strength training and information regarding Carbohydrates intake and hydration. The questionnaires for team managers and medical practitioners were pre adapted from the SSAT tool and specifically focused on the sports safety and policies in place among the rugby clubs.

Validity and Reliability. To ensure the content and face validity of the adapted player and coach questionnaires, they were reviewed by experienced sports safety experts, experienced coaches, referees and sports development officers working as technical advisors in KRFU, with close consultations with qualified and experienced sports physiotherapists and the researcher. Although both instruments had been extensively used in the UK, no reliability figures are available therefore a 2-week test-retest reliability pilot study was done on 15 players and a team coach from the lower division (Eric Shirley) team to determine how valid and reliable the instruments were.

The Sport Safety Assessment Tool (SSAT) which was used to collect information from team managers and medical practitioners had been validated in previous studies (Donaldson and Hill, 2002; 2003) with a test-retest reliability of 91% and the inter-rater reliability ranging from 62-75% while the internal consistency Cronbach's alpha co-efficient was 0.70- 0.80 in the original study (Donaldson et al., 2003). To ensure the content and face validity of the SSAT tool, it was reviewed by experienced sports safety experts, experienced coaches, referees and sports development officers working as technical advisors in KRFU, with close consultations with qualified and experienced sports physiotherapists and the researcher. During the pilot study the test-retest reliability was found to be 92%, inter rater reliability ranged from 70% to 80% while the internal consistency Cronbach's alpha co-efficient ranged from 0.773 – 0.854 with an average of 0.854

Ethical Clearance. Ethical clearance was attained from the Senate Research Grants and Study Leave Committee at the University of the Western Cape. The researcher also obtained permission to carry out the study in Kenya from the Ministry of Higher Education's National Council for Science and Technology and the Kenya Rugby Football Union. Written informed consents were sought out from all participants and an information sheet was used to brief the participants on what all the study was about.

Results

On the use of protective equipment such

as headgear, mouth guards, ankle braces and appropriate footwear during training and competitive matches. Almost two thirds of the rugby players 109 (67.3%), never used headgear during training and 106 (65.4%) during matches. Only 11 (6.8%) always used headgear during training and 25 (15.4%) during matches. On mouth guard use, almost half 73 (45.1%), of the rugby players had never used mouth guards during training and 70 (43.2%) during matches. While less than a third 41 (25.3%) of players always used ankle braces during training and 49 (30.2) during matches. Most of the players had always used appropriate footwear during training 121 (74.7%) and matches 128 (79%).

Team coaches reported on their perception on how they thought on their players' use of protective gear during training and matches and almost three quarters 5 (71.4%) of the team coaches reported that majority of the players never always used headgear, mouth guard and ankle braces during training and matches. However, almost three quarters 5 (71.4%) of the team coaches reported that majority of their players always used appropriate footwear during training and matches as summarized in table 1

Warm up. Both rugby players and team coaches reported on the activities they included as part of their warm ups and more than three quarters 121 (76.6%) of the rugby players always conducted a warm up prior to training while 133 (85.7%) only conducted a warm up prior to matches. However, team coaches slightly differed with players as over 70% of the coaches had always conducted warm up prior to both training and matches as summarized in table 2. During warm up 45 (28.5%) of the players conducted warm up for up to 15 minutes prior to training while 59 (38.3%) conducted warm up for a duration of more than 25 minutes prior to competitive matches. Team coaches differed with players as 3 (42.9%) indicated to conduct warm up for at least 10 minutes prior to training and 15 minutes 4 (57.1%) prior to competitive matches as illustrated in table 3. Majority of the players (54.7%) and coaches (71.4%) indicated that they always warmed up their muscles before stretching as shown in table 2.

Cool down and stretching. The highest percentage of players 57 (35.2%) indicated that they spent at least 10 minutes in cool down activities after training and 49 (30.8%) for 5 minutes after matches. Similarly, 6 (85.7%) of the coaches indicated that players spent at least 10 minutes conducting a cool down after training and 5 (71.4%) after matches as summarized in table 3. As far as supervision of cool down activities by coaches were concerned 56 (34.6%) of the rugby players indicated that coaches always supervised cool down activities after training and 57 (36.1%) matches. Coaches differed slightly

with player as 4 (57.1%) of the coaches never always supervised their players during cool down activities after training and 2 (28.6 %) matches as illustrated in table 3

Activities included in cool down included stretching, calisthenics and jogging. Table 3 summarizes the responses from rugby players and coaches respectively.

Stretching major leg muscles. Almost three quarters (73.3%) and (76.6%) of players always stretched their major leg muscles during warm up prior to training and matches respectively. Similarly, more than two thirds (67.7%) and (64.6%) of the team coaches reported the same. On the other hand, more than half (57.1%) of the coaches indicated that their players always stretched their major leg muscles during warm up and cool down at both training and matches as illustrated in table 4.

More than a third 36.8% of the players indicated that sometimes they bounced while stretching while (20.2%) never bounced at all while stretching. However, coaches (42.9%) indicated that none of their players bounced while stretching as illustrated in figure 1.

Duration of holding a stretch

Almost half of the players held their stretch for at least 10 seconds. Similarly (57.1%) team coaches reported the same as illustrated in the figure 2.

Flexibility and strength training

Less than a third 34 (22.8%) of the players conducted flexibility training twice a week while a similar percentage of the players never conducted flexibility training. Similarly, 3 (42.9%) of the coaches indicated that they only conducted flexibility training as a team session once per week as outlined in table 3. Further, almost a third of the players 44 (30.3%) never conducted flexibility training as an individual effort while 31 (21.4%) conducted flexibility training twice per week as outlined in table 4. 39.9% of the rugby players did not undertake strength training as a team session while almost half 3 (42.9%) of the coaches reported that their teams conducted strength training as a team session once a week as summarized in table 5.

Pre-season training

Less than a third (29.8%) of the players and 42.9% started pre-season 3 weeks earlier before resuming the season as outlined in table 6.

Hydration

A percentage of 38.3% of the players took a very good amount of water during training and matches. Team coaches (71.4%) similarly reported that their players took adequate amounts of water during training and matches as illustrated in table 7.

Nutrition

Almost a third (27.5%) of the players often took some carbohydrates before the training and 28.6%

always took some kind of carbohydrates after training. During matches less than a third (26.1%) of the players often took some kind of carbohydrates before the match, while still less than a third (28.2%) always took some kind of carbohydrates after matches. Team coaches similarly reported the same as outlined in table 8.

Advice given on nutrition

Almost half (76) of the players were given little advice on what to eat before and after training and matches. Similarly, more than half (4) of the team coaches reported that their players were never given advice on what to eat before and after matches and training as illustrated in figure 3.

DESCRIPTION OF SPORTS SAFETY PRACTICES FOLLOWED BY CLUBS

Participants reported on different sports safety practices in place in their various clubs and union and what role they played to ensure successful implementation of these sports safety practices in their clubs.

Sports safety practices followed by team coaches and rugby players

More than a half (51.3%) of the team coaches always considered players' physical development and build up when assigning position. Similarly coaches balanced fitness and skills development at training, gradually increased training intensity, and taught players on landing, tackling and safe play techniques. However, less than half (42.2%) of the players reported that coaches always modified play according to the weather and playing surface as illustrated in table 9.

Coaches reported on the sports safety practices they followed and 57.1% had always considered players' physical development and build up when assigning positions while (85.7%) balanced fitness and skill during training, gradually increased training intensity, taught players landing, tackling and safe play techniques, and modified play according to weather and playing surface as illustrated in table 10.

Sports safety practices followed by team medical practitioners

Team medical practitioners reported the sport safety practices they had implemented and any other safety practices they had observed to be in place in their various clubs. All team medical practitioners (100%) observed that padding of corner and goal posts was always done during matches and water was always made available during training and matches. However, 50% of the team medical practitioners observed that padding of corner and goal post was not always done during training while a third (33.3%) of practitioners reported that the players' equipment was never checked by an official both during training and matches. The same

number reported that a telephone was not available at training, however almost two thirds (66.7%) reported that telephone was always available during matches. A third (33.3%) reported that access by ambulance to the club's training facility was never ensured except during competitive matches. Similarly appropriate first aid kit and playing ground condition was not ensured. Nevertheless, almost two thirds (66.7%) of team medical practitioners attended training sessions as illustrated in figure 9.

Further the team medical practitioners reported on the sports safety practices they followed in their clubs to help prevent rugby injuries and 6 (100%) had always encouraged players to warm up, cool down, drink water and stretch during training and matches. Similarly, 6 (100%) medical practitioners always encouraged their players to seek treatment when injured as illustrated in table 11

Availability and use of protective equipment

Players and team coaches were asked if they ensured that their protective equipment were in good condition, maintained and available for use when needed and 57.1% of the rugby players always ensured that their protective equipment was available and used. Similar percentage of the players did not always ensure that their protective equipment is appropriate, sized properly, fitted correctly and maintained. However, only 48.1% of the players always ensured that their protective equipment was repaired when damaged, is of high quality and in good condition as illustrated in table 13.

Team coaches were asked the same to get a clearer picture on their role in implementation of these sports safety practices and only 42.9% of the coaches often ensured that the players' protective equipment was available and used, appropriate, and repaired when damaged. However, only 57.1% often ensured that the players' protective equipment was of high quality, in good condition, sized properly, fitted correctly and maintained as illustrated in table 13.

Sports safety practices implemented by team managers

Team managers reported on the sport safety practices in place in their clubs and this was because the team managers are directly involved in formulation and implementation of sports safety practices and policies in their various clubs and 57.1% of the team managers always ensured that telephone was available at training and matches and ambulance always accessed their facility at both training and matches. 42.9% reported that qualified first aid personnel always attended training and matches however qualified cardiopulmonary resuscitation personnel never attended both training and matches while 42.9% reported that corner and

goal posts were only always padded during matches. Finally, 14.3% of the managers reported that referees and their assistants, team coaches and medical practitioners' qualification were never checked by club or union as summarized in table 14.

Other sports safety practices followed in the clubs

Coaches were also asked to report whether they had other specific sport safety practices such as injury record keeping, promoting training and providing information on safety practices and policies to their club members and if the club would like to get assistance in developing and implementation of sports safety practices and 4 (57.1%) of the team managers reported that their clubs did not keep record of injuries however they promoted attendance of relevant club members in safety training. Nevertheless, all the team managers 7 (100%) reported that they could like to access to more safety training and get assistance in developing sports safety programmes as shown in table 15

Managers' opinion on who should support clubs during implementation of injury prevention strategies

Managers reported on who they thought was best suited to play a role in assisting clubs in implementation of rugby injury prevention strategies and 85.7% of the team managers felt that the Rugby Union should play a role in the implementation of rugby injury prevention strategies. Consequently, 42.9% felt that the IRB and team medical practitioners should play a bigger role in the implementation process as illustrated in figure 5.

DISCUSSION

SPORTS INJURY PREVENTION STRATEGIES

Use of protective Equipment

Protective equipment is made specifically to protect specific body parts from the risk of injury while allowing the athlete to participate in different sporting activities. It is also used on return to play after injury to prevent any further or aggravation of injury during the direct contact phases of the sport. Such protective equipment include mouth guards, shoulder pads, forearm and groin protectors, knee pads, wrist guards, footwear, headgear, braces and taping (Brukner & Khan, 2011). Researchers have shown that the use of protective equipment can prevent injury incidence (Jones et al., 2004; Wilson, 1998). Use of headgear can minimize the degree of severity of concussion in players who use it, compared to players who do not (Kahanov, Dusa, Wilkinson & Roberts, 2005). Similarly Jones et al. (2004) found that headgear reduced the risk of head and face injuries.

The present study findings showed inconsistent use of protective equipment at both training and

matches, despite the fact that players and coaches were aware of the fact that it can minimize risk of injury. Similar findings have been reported in previous studies (Donaldson et al., 2002; Hawkins & Fuller, 1998). The poor use of protective equipment by rugby players in the current study could be due to the fact that players were never encouraged by coaching staff to use the protective equipment at both training and competitive matches, as argued by Hawkins and Fuller (1998). In addition, inaccessibility to protective equipment for players due to financial constraints, as most of them were university students, could be another reason for the inconsistent use as also highlighted by Kiwanuka (2011). This should be brought under the attention of team managers, coaches, and team medical officials to facilitate encouragement of players to always use protective equipment at both training and matches as they can drastically reduce injury incidences as stated by Hawkins and Fuller (1998).

This study also depicted a lack of knowledge regarding injury occurrence and risk factors among rugby players and coaches. Players and coaches also did not know which time of play had a greater risk of injury, and if an action of another player can cause an injury. Even though coaches agreed that use of headgear can minimize risk of head injury, they did not ensure that players always used the protective equipment.

Therefore, more studies need to be conducted to carefully examine if there is a relation between rugby injuries and use of protective equipment at both training and matches. In addition, the present study findings show inadequate use of protective equipment and lack of sports injury prevention knowledge, therefore these factors might have exposed the majority of players to risk of sustaining an injury. In future clubs and unions should hold workshops and conferences and use media to educate and create awareness among players, team coaches, manager, medical practitioners and the public at large on sports injury prevention, occurrence, risk factors and management and encourage players to use protective equipment.

Warm up

Warming up and stretching before and after training and matches can effectively help minimize the risk of injury (Woods, Bishop & Jones, 2007; Mjøl̂snes, Arnason, Ostagen, Raastad & Bahr, 2004; Kujala, Orava & Jarvinen, 1997). The present study findings reported that the majority of players conducted warm up and were aware of different sports injury prevention strategies. This is similar to Hawkins and Fuller (1998) study findings. Although the majority of players engaged in warm-up activities, a considerable number of injuries still occurred at both training and matches. A possible reason for this could be that the majority of players

engaged in warm-up activities for less than 25 minutes. This is an inadequate time as it has been shown that an appropriate duration of warm-up should be between 25 – 30 minutes for intense sporting activities such as rugby (Training.gov.au, 2012). In addition, understaffing of physiotherapists and sports trainers might have played a key role in insufficient warm up. Nevertheless, individual player susceptibility, inadequate rehabilitation and early return to play may be the reason for high injury prevalence (Dadebo et al., 2004).

This study highlights the depth of knowledge regarding the appropriate duration of warm-up activities among rugby clubs in Kenya. Rugby teams should always perform warm up activities for the recommended of at least 25 minutes or more, prior to training and matches. Clubs should ensure that they employ sufficient team medical practitioners to assist in directing and conducting warm up in future. Furthermore, it is also important to conduct further research on the role of warm-up on performance and minimizing injury incidences in different environmental conditions in future (Bishop, 2003).

Cool down and stretching

Cool down enhances the elimination of muscle metabolism waste products and enhances the recovery time (Stamford, 1995 as cited in Pharaoh & Assuman, 2011). Similarly, stretching has been found to increase flexibility, muscular strength and reduce injury risk if practiced adequately (McArdle, Katch & Katch, 2006; American College of Sports Medicine, 1998).

The finding of this study showed that few players conducted cool down, however, the majority of the players always stretched during warm up and cool down before and after matches and training. Similar findings have been reported in previous studies (Donaldson et al., 2002; Hawkins & Fuller, 1998). The reason for players not engaging in cool downs may be that they were too tired after matches and training or they lacked advice or appropriate skill in conducting the cool-down and stretching. Therefore, cool down and stretching should be encouraged among players after training and matches, as it can help minimize risk of injury. Moreover, improvement in the technique of stretching and consistency of these techniques may help minimize injury incidences (Dadebo et al., 2004).

Flexibility and strength training

Muscle flexibility reduces risk of injury (Verrall et al., 2005; Worrel & Perrin, 1992; Wallin et al., 1985). Furthermore, flexibility training with static stretching for at least 2-3 days per week with each stretch held to a mild discomfort for 30-60 seconds with 3-4 repetition per stretch has been found to be effective (McArdle, Katch & Katch, 2006). Similarly, strong muscles can protect players from injury and may reduce injury incidences (Heiser, Weber,

Sullivan et al., 1984).

This study, however, found that the majority of players did not conduct pre-season conditioning, strength and flexibility training even though the majority of the players and coaches agreed that players who do not conduct flexibility are more prone to injuries than those who do not. This lack of strength training may be associated with lack of knowledge regarding the importance of strong muscles as part of injury prevention. Moreover, players may have not been encouraged and given advice on the correct technique of undertaking flexibility and strength training. In addition, lack of proper equipment might have contributed to the inadequate flexibility and strength training as it was reported by players in this study.

In general, team coaches and medical practitioners should encourage their players to conduct warm-up, cool-down, stretch and conduct flexibility and strength training as it can help minimize injury risks (Verrall et al., 2005; Woods, Bishop & Jones, 2007). Nevertheless, further education of coaches on injury mechanisms, risk factors and early management of sports injuries should be staged in future (Carter & Muller, 2008).

The study findings suggest that team physiotherapists and physicians should play a significant role in educating and supervising players on stretching techniques during cool down and warm-up activities (Ekstrand et al., 1983). In addition, players should always be supervised by coaches, sports trainers, biokineticists and physiotherapists when conducting warm ups, stretching and cool downs.

Nutrition and Hydration

For the past years, researchers have tried to understand the role of proper nutrition in health and performance in sports (Brotherhood, 1984). For instance, balanced nutritional and fluid intake may play an important role in improving athletes' performance (Sallis, 1996) while inadequate hydration may result to life threatening injuries/conditions such as heatstroke (American Dietetic Association, Dieticians of Canada and American College of Sports Medicine, 2000). Furthermore, inadequate nutrition intake may lead to increased injury risk and slow athletes' recovery (Brukner & Khan, 2011). According to Brotherhood (1984) the high-power output by sports personalities requires substrate energy and water with carbohydrate, specifically muscle glycogen being recommended in athletes who require greater power output.

This study finding showed that rugby players took very adequate amounts of water at both training and matches. However, there was poor intake of carbohydrates by players at both pre and post training and matches. Moreover, the rugby players were never given enough nutritional advice.

Similar findings have been reported by Hawkins and Fuller (1998), where players had inadequate intake of carbohydrate and information regarding nutrition.

This study finding suggests that more advice to players and coaches on nutrition is needed from experts in sports nutrition, and in future teams should consider hiring services of a sports nutritionist. Moreover, teams are encouraged to always supply enough carbohydrate foods, water and sports drinks to their players prior and after matches and training sessions. Furthermore, team coaches, managers and team medical practitioners should attend sports nutrition workshops and courses to get more information regarding proper nutrition in athletes; this will help them to be in a position to advise their players on what to eat and drink.

SPORTS SAFETY PRACTICES AND POLICIES

Few studies have investigated sports safety policies and practices (Casey et al. 2004; Donaldson et al., 2002). Sports safety policies and practices ensure that sporting activities are carried out in a safe and hazard free environment (New South Wales, 1999). Moreover, sports safety practices and risk management are essential as they help sports bodies to prevent or reduce injuries (SISAC, 1995 as cited in Finch & Hannessy, 2000). According to Finch and Hannessy (2000) sports safety is an important part of health and therefore an understanding of sports safety policies and practices can effectively help identify gaps and enable in the implementation of comprehensive injury prevention programmes. Moreover, sports safety practices and policies may also help clubs to improve their facilities and enable them to implement injury prevention strategies. Nevertheless, they may be useful to clubs and governing bodies during the implementation and evaluation of injury prevention initiatives (Donaldson et al., 2002).

This study finding indicated that the majority of the team coaches considered players' physical development and build up when assigning positions, balanced fitness and skills development at training, gradually increased training intensity and taught players on landing, tackling and safe play techniques. In addition, the majority of rugby players and team coaches ensured that the protective equipment was always appropriate, sized properly, fitted correctly and maintained but this was not checked regularly by an official at both training and matches. However, they did not ensure that protective equipment was repaired when damaged, is of high quality and in good condition. Nevertheless, the team coaches never modified play according to weather and playing surface. All these might have put more rugby players at greatest risk of injury and it should be brought under the attention of team coaches and

team management.

Team medical practitioners played a major role in implementation of injury prevention strategies as they always encouraged players to drink water at training and matches, warm-ups, cool-downs, stretch and seek treatment when injured, but they were unsupervised warm-up and stretching sessions. This is contrary to Ekstrand, Gillquist and Liljedahl (1983), who recommended that physiotherapists and team physicians should supervise warm-ups, cool-downs and stretching.

On the other hand, managers did not ensure the availability of telephone and padding of goal and corner posts at training, and neither did they ensure the attendance of qualified cardiopulmonary resuscitation personnel at both matches and training. However, they ensured attendance of qualified first aid personnel at both training and matches. Neither did the clubs or union check the qualifications of referees and their assistants, team coaches and team medical practitioners. Furthermore, the clubs did not keep record of injuries even though they promoted attendance of relevant club members in safety training. In addition, clubs reported that they would like to access more safety training and get assistance in developing sports safety programmes. This is contrary to Donaldson et al. (2002) where clubs wanted to access more safety training but did not want assistance in developing the sports safety programmes.

All clubs indicated that they would like the union, IRB, team medical practitioners, club members and the Government to play an important role in assisting them to implement different sports safety programmes in their clubs in future. This is similar to an Australian study (Donaldson et al., 2002) where clubs revealed that they would like to get help from their government, union and associations in implementation of their safety programmes.

This study finding suggests that programmes targeted at putting into effect sports safety practices and policies in any nationwide league should incorporate all the club members and governing bodies such as the players, team coaches, team medical practitioners, team managers, governing union, IRB and the Government. Moreover, the county councils can also play a big role in setting standards for sports safety and disseminating sports safety information and resources (Donaldson et al., 2002). In addition, these study findings indicate that safety practices are less often implemented during training than during matches. Therefore, as injuries occur more at training, and players always spend considerably more time at training than competing, therefore clubs should always ensure that adequate sports safety policies and practices are always carried and put into practice at training (Donaldson, Forero, Finch & Hill, 2004).

Conclusion

There were deficiencies in the use of protective equipment, warming up and cooling down during training and matches, moreover inadequate warm-up and cool-down duration. Nevertheless, clubs did not conduct flexibility and strength training and there was no attendance of qualified Cardiopulmonary resuscitation personnel at both training and matches, while playing surfaces were not also ensured to be in good condition before matches and training, clubs did not record injuries. Clubs too did not ensure proper carbohydrate consumption by players prior to and after matches and training. Therefore, there is a need to translate the latest scientific evidence about effective injury prevention into coaching practices, and this should be brought under the attention of team management. These include pre-season training, correct duration of warm-up/cool-down activities, stretching, flexibility and strength training, adherence to the rules of the game, and the consistent use of protective equipment.

On the other hand, although the majority of clubs followed sports safety practices during matches, they never ensured the same during training. Moreover, none of the clubs had written sports safety practices and policies in place, therefore clubs should elect a sports safety committee to ensure that sports safety practices and policies are developed and implemented in future as they have been proved to play a significant role in sports injury prevention.

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Competing Interests

The authors declare that they have no competing interests.

Contributor ship

Lamech Bogonko contributed to the study conception and design, data collection, analysis, interpretation of findings, and manuscript drafting and review. While Prof Julie Phillips contributed to study supervision, methodological guidance, interpretation of results and overall academic guidance.

The study new findings and its impact on clinical practice in the future

- The study identified new gaps in sports safety implementation among rugby clubs in Kenya

The study provides new evidence that significant deficiencies exist in the implementation of sports safety practices and policies among rugby clubs in Kenya, particularly during training sessions. This knowledge highlights the need for more structured injury prevention systems within rugby environments.

- The study identified the importance of training-based injury prevention programmes

The study findings revealed that sports safety measures were less consistently implemented during training compared to matches, despite training accounting for greater player exposure time. This emphasizes the importance of extending clinical injury prevention strategies beyond competition settings into routine training activities.

- The study identified the role of multidisciplinary collaboration in injury prevention

The study demonstrated that effective implementation of sports safety programmes requires collaboration between coaches, medical practitioners, club managers, governing unions, and government agencies. This may influence future clinical practice by encouraging integrated approaches to sports injury prevention and athlete health management.

- The study identified the significance for structured injury surveillance systems

The absence of injury recording systems in clubs highlighted a major gap in injury monitoring and evaluation. Future clinical practice may benefit from the development of standardized injury surveillance programmes to improve injury tracking, early intervention, and evidence-based decision-making in sports medicine.

- The study identified the need to translate the scientific evidenced approach into coaching and clinical practice

The findings reinforced the need to translate evidence-based injury prevention strategies, such as proper warm-up protocols, strength and flexibility training, hydration practices, and protective equipment monitoring, into routine coaching and clinical practice. This may contribute to reduced

injury incidence, improved athlete safety, and enhanced long-term player health outcomes.

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