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Sports and Exercise Medicine for Athletes and Footballers: The Case of Kenya

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SIT Study Abroad

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*Sports and Exercise Medicine for Athletes and Footballers:
The Case of Kenya*

Monil Patel

SIT Kenya: Urbanization, Health and Human Rights

Spring 2015

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Table of Contents:

Acknowledgements.....	1
Abstract.....	2
Introduction.....	3
Setting.....	8
Statement of the Problem.....	11
Objective.....	14
Specific Objectives.....	14
Literature Review.....	15
Methodology.....	23
Findings and Analysis.....	24
Conclusion.....	49
Recommendations.....	51
Works Cited.....	53
Appendix.....	55

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Abstract:

Sports are one of life's greatest gifts. People love watching, discussing and participating in sports. Kenya has a rich and successful history in certain sports, notably in athletics (track and field). Since the 1960's, Kenyans have won several gold medals and numerous world champions. In addition, Kenyans have dominated the world marathons since the 1980's. Kenya has some of the best yet simplest training areas, some of the best coaches, and some of the hardest working athletes in the world. However, people do not realize that many Kenyan athletes only shine for a few years before they vanish in the light of other athletes. The turnover rate is so high yet so unnoticed. A major reason for this is because of the poor overall understanding and application of Sports and Exercise Medicine (SEM) and Physiotherapy. Physiotherapy is offered to the elite athletes, yet the concept of SEM and the doctors specializing in SEM is essentially non-existent. One injury can end an athlete's career, especially an amateur athlete with no access to services, and this contributes to the high turnover rate.

Football, however, does not have a prosperous history, and currently Kenya's domestic league is far worse than the leagues in Europe and South America. Unlike athletics, football in Kenya has poor facilities, poor coaching, a lack of equipment and insufficient funding. Many people are aware of these issues and realize this as a problem. However, nothing is done in the field of SEM and physiotherapy. Footballers tend to receive much more serious injuries than athletes, due to football's high amount of contact, and many footballers end their career early. The potential of footballers in Kenya is incredibly high, however, one simple injury that could be dealt with in Europe or the United States is overlooked in Kenya, and the results are devastating for the footballer.

This project will aim to study the available and affordable treatment for Kenyan athletes and footballers, while also looking at different aspects such as ways to improve the accessibility and methods of treatment, the influence of the government and media, and reasons why athletics in Kenya still thrives while football is struggling.

Introduction:

Sports are such an incredible activity, because they are suited for all ages, races, genders, and even those physically impaired. They give people a fun way to exercise and keep them healthy. They help people de-stress and have fun, while also teaching skills such as team building, hard work, respect, and honesty. For those who do not like to play sports, watching sports is also an enjoyable act that can be done both alone and with friends. The topic of many conversations can be about sports, and many people make a living playing sports, analyzing sports, sportscasting and more. The concept of sport seems very simple, because for a majority of sports, all you need is a ball, a few players, and an open space. However, at the higher levels of sports, there are many components that go into successful sportspeople and successful teams. These components include good training, good coaching, proper equipment, proper facilities, sufficient funding and good player salaries. However, one major concept that has reached Europe and America much faster than Kenya is Sports and Exercise Medicine (SEM). The definition of SEM changes rapidly, but SEM is a field of medicine that aims to aid an athlete dealing with physical injuries. However, instead of treating injuries in an allopathic manner, SEM specialists must focus more on an osteopathic and holistic form of treatment. They must care for the entire well being of the sportsperson during their injured time, not just treating the injured area. This includes working to make sure the athlete is mentally healthy, teaching the athlete about ways to help their healing process, and teaching them about injury prevention for the future. In Kenya, the idea of SEM has not reached the people, and this plays a major role in the shortened careers of many sportspeople.

The history of SEM is brief but important. The ancient Greeks were known to be the first people to be athletic doctors, but up until the late 19th century, the idea of SEM all but died out [4,7]. Athletes at Harvard University were taught about the relationship between physical performance and treatment and people began to sideline sporting events in the 1940s and 1950s. In 1961, the term Sports and

Exercise Medicine was revived and started being used. In the 1968 Summer Olympics, Dr. J.C. Kennedy brought a team of doctors to care for the participating sportspeople. Dr. Kennedy later founded the Canadian Academy of Sports and Exercise Medicine, and along with the American College of Sports Medicine and the British Association of Sports and Exercise Medicine, these organizations have led the world in SEM research and application. In the late 20th century Sports and Exercise Medicine became a separate area in the field of medicine. In the current 21th century, SEM has blossomed in the United States and in European countries and has created several medical careers such as physiotherapists, sports and exercise medicine doctors, physical medicine and rehabilitation doctors, and orthopedic surgeons. Some of the best facilities and machines in the world are for sports medicine, and billions of dollars gets put into further research and development in the field of sports medicine.

Unfortunately, the medical progress of sports in these developed countries has not fully reached Kenya yet. Kenya, a country in Eastern Africa with a population of around 45 million, is well known for its success in the sport of athletics, notably long distance running. Kenya has over 460 professional athletes with around 400 of them being long distance runners [4]. They have had incredible success in the Olympic Games and the World Championships, winning a total of 179 medals, 62 of them being gold. They consistently places their athletes in the top 10 in world marathons, with Caroline Rotich recently winning the Women's Boston Marathon and Eliud Kipchoge winning the Men's London Marathon a few days later. The average person from across the world would know Kenya's dominance in athletics, and rightfully so. However, Kenya has struggled in every other sport, notably football, in which they have yet to qualify for a FIFA world cup and have only qualified for 5 Africa Cup of Nations out of 30 tournaments [5]. They have yet to make it to the knockout stages. Over 200 professional footballers are currently active in Kenya, however, unlike athletics, Kenya has yet to be a powerhouse in football. The stunted medical progress of sports in Kenya appears to only affect the footballers, however, it also has serious effects for the athletes as well, although not as severe. The

reasons for this will be explained later on.

The history of athletics in Kenya is quite special and unique. There are several important time periods that have created the greatest dynasty of runners in the world. In 1951, the Kenya Amateur Athletics Association (KAAA) was formed, and Kenya began to participate in international competitions. The 1960's saw an explosion of Kenyan success, especially in the Tokyo and Mexico olympic games. In the 1964 Tokyo games, Wilson Kiprugut Chuma won Kenya's first ever medal (bronze) in the 800 meters. In 1968 Mexico games, Naphatali Temu won Kenya's first ever gold medal in the 10,000 meter race. However, the most famous Kenyan record was Kipchoge Keino's stylish 1500 meter victory in Mexico [4]. He opted out of the race the day before due to gallstones, only to defy the doctor and change his mind the morning of (and even ran from his hotel to the race). By 1972, Kenya had put itself on the world map in the field of athletics. At the same time, the migration of Kenyans to the United States on running scholarships was extremely prevalent. These athletes would use these opportunities to receive a better education. This increased the number of Kenyan athletes residing and competing in foreign countries. Kenya faced a bit of a roadblock when it chose to boycott the 1976 Olympics (along with 27 other countries) and the 1980 Olympics (along with 65 other countries) for political reasons, which hurt them in the 1984 Olympics when they only won two medals. However, 1980 saw the organization of the junior championships, which encouraged and motivated the youth to train hard. The mid to late 1980's saw the shift of Kenyan athletes back to Kenya to train instead of the United States.

The senior runners kept good relations with the younger amateur runners, and this created unity and a stronger training environment. In 1986, an Irish man by the name of Brother Colm O'Connell started the first high altitude training camp in Iten, a small village in the mountains of the rift valley. Since then, there have been over 100 high altitude training camps in this village and the largest urban center of Eldoret. Athletes would choose to train at these camps instead of going abroad, and the

domestic talent of Kenyans skyrocketed. By the mid 1990's, both the men and women of Kenya emerged as powerhouses in the sport of athletics. The woman, who previously were not as successful as the men, were now performing just as well-if not better- than the men. At the 1996 Atlanta Olympics, Pauline Konga became the first Kenyan woman to win an olympic medal in the 5000 meters (silver). At the start of the 21th century, Kenya became ever more dominant, especially in the marathon. In the 2008 Olympics in Beijing, Kenya dominated by winning 6 gold, 4 silver, and 4 bronze medals in athletics. Currently, Kenya still dominates in the field of athletics, and this dominance does not seem like it will go away anytime soon. Although Kenya is so powerful in athletics, there is still a major issue of injuries and how they are dealt with, and this will be discussed later.

The history of football in Kenya is much less grand and impressive, but equally as important to understand. The British brought over the sport in the early 20th century, and by the 1940s, the Kenyan National Football Team was competing in local east african competitions. In 1960, the Kenyan Football Federation (KFF) was created to organize football in Kenya. Football was dominated by those in the coast province, showcasing classy players such as Kadir Farah, Ali Sungura, and Ahmed Breik. In the early 1960s, a meeting was held in Nairobi to create a domestic league in Kenya. In 1963, 10 teams were created to play in the league- 7 teams in Nairobi, 2 teams in the Coast province, and 1 team in the Rift Valley Province. Teams from Western, Central, and Nyanza Province were all set to join later. In 1965, Kenya played the Black Stars of Ghana who were the African champions at the time. Kenya lost the match 13-2, and President Jomo Kenyatta, present at the game, never attended another game. This loss of faith from the president definitely stunted the growth and funding of football in Kenya. However, tribal rivalries, provincial rivalries, and overall high spirit for the game kept the sport of football exciting and popular in Kenya. In 1972, Kenya entered its first African Cup of Nations tournament, but failed to advance to the second round, tying two games and losing one. In 1974, Kenya entered its first FIFA world cup qualification, but failed to advance to the world cup. In the mid 1970's,

the arrival of German coach Bernard Zgoll (national team coach in 1984 but local coach in the seventies) marked the biggest step forward for Kenyan football. Zgoll created national youth development centers all over the country to discover and develop footballers at a young age. Many great players emerged from these centers, such as Dick Anyanga, Sammy Owino Kempes, and Jared Ingutia. In the 1980s, football in Kenya showed great promise and success for the future. Kenya won three successive CECAFA (Council for East and Central Africa Football Association) cups from 1981-1983. The national team also traveled to places like Germany and Brazil to gain better experience and training. For the rest of the decade, Kenyan club teams such as Gor Mahia and AFC Leopards dominated on a continental club level, attracting players from all over the continent to play in Kenya [5].

The 1990's saw a dip in the performance of Kenyan football. Kenya performed decently well in the 1990 Africa Cup of Nations, with footballer Washington Muhanji even getting offered European contracts (unfortunately he had a contract with the army and could not go). Kenya was set to host the 1996 African Cup of Nations, however, President Moi failed to deliver his promise of building new stadiums. He feared losing political power since the head of the KFF, Job Omino, was part of the opposing political party, and Moi thought Job would use the infrastructure to take credit and eventual political control. As a result, Kenya was banned for two years. It was the one of several political quarrels that affected the growth of Kenyan football. This trend continued as the new millennium saw the absolute worst period in Kenyan football. The KFF had a new group of representatives, led by Maina Kariuki. Maina promised several positives goals, and fans had every reason to be hopeful. However, he looted the KFF treasury, drove away sponsors, and lost many fans due to alienation. When all hope had been lost, German coach Reinhard Fabisch was hired and started rebuilding the Kenyan team. He helped send many players to Europe, and Kenya was back on the map by the mid 2000's. However, he argued that the Kenyan players were not getting paid enough and were not taken care of,

and the KFF fired him because they disagreed. This shows the corruption of the KFF and how Kenyan football had serious potential once again, that was shut down because of politics. Because of the corruption, many top class teams decided to break apart and create the Kenyan Premier League (KPL) in 2003, which remains as Kenya's top current domestic league. The rest of the decade was followed by more corruption and circus acts, and these actions continue to remain today [5]. Kenyan football still has hope, however, due to the emergence of stars Victor Wanyama and his brother MacDonald Mariga, playing for Southampton in the English Premier League and Inter Milan in the Italian Serie A, respectively. This study will be done on the sportspeople of Kenya, but only amateur athletes and professional and semi professional footballers, respectively.

Setting:

Kenya has two cities that really dominated in the areas of athletics and football. In athletics, the major training area is Eldoret, and in football, the major area is Nairobi. For this independent study project, time was split between Eldoret and Nairobi. Two weeks were spent in Eldoret, Kenya's fifth largest urban center located in the western Uasin Gishu Country in the Rift Valley. The population of Eldoret is 290,000 and it is an area well known for its schools, hospitals, and athletes. Some of the best schools in the country including KipKeino Primary and Secondary, Gulab Primary and Secondary, and Testimony Secondary School are in Eldoret. One of Kenya's two national referral hospitals exist in Eldoret, Moi Teaching and Referral Hospital. In addition, Eldoret Hospital and Aga Khan are some of Kenya's best private hospitals. According to the locals, it is a very calm area, and people here tend to live a quiet and peaceful life.

Eldoret, and its neighboring mountain town of Iten have been the training grounds for most of the athletes for the past few decades. Iten, a much smaller farming town completely known for housing many of the worlds best athletes, has a mere population of 4,000 people. Both Eldoret and Iten are

located in the rift valley, and the hilly surface combined with the high altitudes (~2100 meters in Eldoret and ~2500 meters in Iten) makes both areas the toughest and therefore perfect places to train. The high altitude is beneficial because the air is much thinner and therefore contains much less oxygen. Therefore, changes in the human body must occur in order to cope with this- the body acclimatizes to the lower level of oxygen. One major change the body makes during acclimatization is the production of more hemoglobin- the protein molecule responsible for carrying oxygen in red blood cells. If more hemoglobin is present, more red blood cells are present, and the body can intake more oxygen. With thinner air and less oxygen present, more hemoglobin and red blood cells must be produced in order for the body to receive sufficient oxygen. In addition, the body must acclimatize by creating better ways to manage lactic acid- the buildup of waste fluid during exercise [2]. With these changes, athletes who then race lower altitude areas such as Boston or London will perform better, because they have more hemoglobin and therefore their body can take in more oxygen, and they have better ways of managing the detrimental lactic acid.

Eldoret and Iten are home to over 100 high altitude training camps. Many of them range in their size and development, and this is mostly dependent on funding and personnel. Arguably the biggest and most well known training camp is the Lornah Kiplagat Training Ground, founded by Kenyan/Dutch world record holder Lornah Kiplagat and based in Iten. Another major training center in Eldoret is run by Dr. Gabriele Rosa, an Italian Doctor who also is arguably the greatest marathon coach in Kenya's history. Due to significant funding and investment, these camps are much more developed and are much better to go to- if you can afford to. Gabriele Rosa's camp costs about \$200 a month, which many amateur Kenyan runners cannot afford. Therefore, his camp, like Lornah Kiplagat's, is meant for world class athletes and foreigners.

The High Performance Training Camp- another well season yet smaller training camp in Eldoret- was also visited during this time. The camp, founded by the famous Kipchoge Keino, has bred

many olympic gold medalists and world champions. The camp is funded by the IOC and IAAF, and due to unfortunate circumstances, the funding is very low. Another place of visit was the High Altitude Sports Training College, although the housing quarters were not open, so walking around the trails was the extent of the visit. However, the adjacent Belio Guest House was open, where many high end athletes live while training on the nearby trails. A high end physiotherapist was interviewed there, and he had wonderful information to provide. Down the street was the famous St. Patricks High School in Iten, home of the 'godfather of running in Kenya' Brother Colm O'Connell. Brother Colm runs a separate development academy for younger athletes- as young as 10 years old. These are athletes who are just beginning to take the sports seriously, and Brother Colm is training them from a young age, the way European Football Academies do with their young footballers. More on this will be discussed later. Lastly, the visit of two hospitals in Eldoret- Moi Referral Hospital and the adjacent St. Luke's Orthopedic and Trauma Hospital- occurred. The research was then concluded in Eldoret/Iten.

The remaining two weeks were spent in Kenya's capital city of Nairobi, originally established in 1889 by the British to be a major railroad stop on the way to Uganda. Since then, Nairobi has grown into the largest city in Kenya (270 square miles) as well as the most populated city (3.36 million people). Nairobi is so large and has so many people that it is also its own county and even its own province. It is the East African hub of business and trade, and has developed into a very metropolitan city with a significant population of expatriates. Nairobi was the perfect place to complete the ISP because it houses many professional and semi professional football teams. The Kenyan Premier League (KPL) is the best domestic football league in Kenya, and 7 out of 16 teams in the league are based in Nairobi. Some of the best teams in the league, such as the 2014 defending champions Gor Mahia, are housed in Nairobi. The Federation of Kenyan Football (FKF), Kenya's second division, also houses 13 of 23 teams in Nairobi. Famous footballers such as Victor Wanyama, Kenya's 23 year old national team captain and regular starter on Southampton in England's Premier League, started his career playing in

Nairobi and in the Kenyan Premier League. The Mathare Youth Sports Association (MYSA) is also located in Nairobi, and is the hub of SEM and football development in Kenya.

At MYSA, various people were able to speak to, including a few professional footballers, football specific physiotherapists, professional coaches, football specific weight trainers, and other staff at the complex. Additionally, a professional football match at Nyayo Stadium in Nairobi was attended and wonderful observations were made. Due to the great deal of information gathered at MYSA and from the game, the research in Nairobi was able to success complete. Nairobi has great potential to be one of the great football cities in Eastern Africa, and hopefully this potential can spread all throughout Kenya.

Statement of the problem:

Kenya shows great potential to be a world powerhouse in both athletics and football. Although Kenya already dominates in athletics, they could be much better, with many more athletes being gold medalists and world champions. In football, especially in the Nairobi area, there is serious potential to have a world class domestic league and produce great footballers. A major reason for these setbacks is the lack of knowledge, technology, experience, and application of SEM in Kenya.

For athletics, especially long distance, the athletes do not need as much treatment as football, because the risk and severity of injuries is much less. This plays a major role in the success of Kenyan athletics. In addition, the level of coaching is much better, and coaches do a better job of injury prevention. However, when athletes do get injured, especially amateur athletes, they cannot get proper treatment here in Kenya. Many of the elite athletes, with connections abroad as well as much more money, will go abroad to get treatment. However, amateur athletes with very little money and no real connections abroad cannot afford to do this. Domestically, many physiotherapists and surgeons are not skilled enough to perform the proper treatment/surgery for these athletes. For those who are qualified to

perform medical processes such as surgeries or arthroscopies, they are inconsistent and unreliable. In addition, most public hospitals lack the proper infrastructure and equipment to perform certain types of surgeries, even if the talent and reliability is available. Many of the best orthopedic surgeons also enter the private sector, so these amateur athletes cannot afford this treatment. The abilities of doctors and the infrastructure provided in the public sector are not reliable and sufficient, and this affects many athletes who wish to rise and succeed in their sport. Many high altitude training camps, where most of the athletes train, do not even have basic equipment (ice, therapy bands, etc.) and there is no basic physiotherapist to assist athletes when needed. If these Kenyan athletes cannot receive proper treatment, their performance will be significantly decreased, and their potential will be ruined.

For many professional football teams in Kenya, there is one physiotherapist for the whole team. Physiotherapists are incredibly talented and informed, however, they cannot deal with major injuries that require surgery, and they have many legal limitations, such as the inability to prescribe medicine. Sometimes there is a doctor, but he/she is not trained in SEM, just as a general practitioner. Sports and Exercise Medicine doctors and orthopedic surgeons are very rare in terms of serving as team doctors. SEM doctors in general are scarce in Kenya, with only one official doctor who specializes in SEM (and he is also an orthopedic surgeon). For amateur or semi professional teams, no doctor or physiotherapist is usually present, and often times the coach needs to act as the doctor. That is clearly not sufficient, and certainly not the coaches job. Many footballers, especially amateur players with little money, have to end their careers early because of injuries that they cannot get proper treatment for. In addition, many footballers lack the medical coverage that they need in order to get treatment. If money is present, sufficient and affordable treatment often times does not exist locally. The Kenyan Premier League (and every league below) is known to have issues with paying players enough and on time, and so any chance of these players having the funds to get treatment abroad is essentially zero. Many of these footballers have great potential, but a simple injury can stop them from achieving full success.

A second major problem is that the government is not sufficiently assisting the athletes and footballers whatsoever. There is barely any government funding, they are not taking any interest, and they are even taking control of some of the sports facilities, which affects the liberty of the athletes. As previously stated- many athletes and footballers must go abroad to get treated. The government does not assist them in any way to make this happen, so many times an injury can end their career. In addition, the government does not take any interest in the development of medical technology and investing in devices that will help its athletes and footballers in the future. This constant backup will rely on private funding, which is not readily available. They also fail to increase the level of medical education, so many doctors are not qualified and reliable to perform simple but important surgeries on footballers and athletes. Many politicians own football teams, and many football teams deny players medical treatment for a variety of reasons. For instance, many footballers lack basic education, and agree to an informal contract without understanding how the legal process works. When the footballer gets injured, the club just fires the player and there is no legal action that the footballer can take since the contract was not formal. Lastly, the government is taking control of many sports facilities, which restricts what the sportspeople can and cannot do. If the government takes control of a stadium and fails to include therapy rooms and equipment, the sportspeople will not be able to get treated (treatment most effective right after injury occurs). For example, the Kipchoge Stadium in Eldoret was meant to have a state of the art track. The track is finished, and has been for some time, but the government is taking too long to open up the track, and this is hindering many athletes from using the track. Many athletes are forced to run on dirt tracks in other areas, which are less safe and could cause injury much easier. Lastly, the government also puts increasing pressure on soccer players and athletes, but fails to help them, so a bit of irony is present.

A third reason is the lack of media coverage. In many European countries, when sportspeople get injured, they make the headlines of the newspapers. This public awareness puts pressure on clubs

and doctors to help assist them as soon as possible. In Kenya, the media is much more interested in the results and outcomes of sporting events, not aspects such as injury. A Kenyan footballer could get injured and even released by the team, and not many people would know. For those footballers who do not get fired, since no one knows what happened, there is less pressure to get these players back on the field. With very little information provided, people do not really know much about the SEM field. Therefore, less people will focus and specialize in SEM, and the numbers of available and capable SEM doctors will be much less. Without the public cry, these sportspeople will remain injured for long periods on time and men and women with incredible potential will not be able to act on it.

Objectives:

The broad objective is to study how Kenyan athletes and footballers are medically treated after injury and the overall medical technology and knowledge that is available for these sportsman.

Specific Objectives:

- 1) Determine the common injuries and assess how amateur athletes and amateur/professional footballers are treated and the problems they face.
- 2) Explore methods to improve the medical knowledge, technology, and experience to help Kenyan athletes and footballers.
- 3) Identify the role the government is playing and how they are affecting the recovery of their athletes and footballers.
- 4) Examine why there is very little media coverage about the recovery processes involving the athletes and footballers.

Literature Review:

One of the primary reasons for the strong interest in sports and exercise medicine in Kenya is the fact that very little written information exists. However, from the few sources available, many different ideas can be extracted.

Kenya: First Bone Surgery Hospital in Kenya Opens in Eldoret

The Star Paper

This short but informative article was one of the starting points to my research. Previously in Kenya, someone would have to wait almost six months after booking to receive a bone-related surgery. This long waiting time was simply due to the lack of infrastructure and orthopedic surgeons present in Kenya and in the Eldoret area. However, in 2013, St. Luke's Orthopedic and Trauma Hospital, located down the street from Moi Teaching and Referral Hospital, was created in order to decrease this waiting time and provide high quality bone surgeries to athletes and common people alike. The creation of this hospital is very important for athletes especially because in past years, they would have to go abroad to get treatment, which is very expensive. Many athletes, especially amateur runners, do not have that kind of money or time. Now, there is a local hospital that specializes in orthopedic surgery and physical injuries. In addition, this hospital is extremely special because it recognizes and separates sports related injuries from the general injuries and surgeries needed for the public. This new hospital plans on being a major career saver for many athletes, and this intention is the main motivation for doing this research project. This article was used to locate St. Luke's upon the visit to Eldoret [1].

Opening of a New Branch of Clinic in Kenya

Hartmann-International

Iten, about an hour away from Eldoret, is a small town that hosts many high altitude running

camps. One of the notable camps is the High Altitude Training Centre, founded by World Champion runner Lornah Kiplagat. There are many components to Lornah's camp, including a gym, IAAF approved running track, countless hills, and room and board. However, a recent addition has been added to the camp. In 2011, Hartmann International, a physiotherapy clinic founded by the world famous physiotherapist Gerard Hartmann, announced the opening of another clinic in the High Altitude Training Centre. This clinic serves to treat the injuries that these athletes receive while training at the camp. This physiotherapy department has been the epitome of the physiotherapy services in Iten, and hopefully many high altitude training camps will follow in these footsteps. Unfortunately, additional charges are required on top of an already expensive training camp, so this clinic will mostly serve high end athletes that can afford the services. Also, since it is only a physiotherapy clinic, they would be unable to treat any major injuries that involve surgery or bone scans. Therefore, this clinic has limitations, but does successfully market physiotherapy and sports and exercise medicine in Iten [3].

Interview with Jeroen Deen: A View from Kenya

Justin Lagat

Jeroen Deen, a world class physiotherapist who splits his time working in Kenya and Ethiopia, has worked with some of the worlds best athletes. In this personal interview conducted by Justin Lagat, although the interview does not provide specifics about the way athletes are treated, it has great information. Jeroen's success stems from such a high emphasis on being more than simply someone who treats injuries. He believes that physiotherapists need to serve as communicators between athletes, families, and coaches, as well as mentors to the athletes. Instead of simply focusing on the injury, he emphasizes making sure the well being and mental health of the athletes are also good. The athletes should be able to come to the physiotherapist with any concern, physically related or not, and the

physiotherapist needs to constantly support the athlete. The athletes are already very stressed out when they receive an injury that they need physiotherapists to be positive and encouraging. Lastly, the physiotherapists should not be in the business for the money, but solely for the passion of running and helping athletes. Jeroen only charges for services, and never asks for extra money. He accepts just enough to make a living and the rest of his work is completely done out of passion. This is a good message for physiotherapists that work with sportspeople, and hopefully more people follow in Jeroen's footsteps [6].

Chicago Bulls Physician Dr. Cole Travels to Kenya to Change Lives

Midwest Orthopedics at Rush

Although not related to a specific sport, this piece of literature is very promising and informative. Dr. Cole, the Chicago Bulls Team Physician specializing in SEM and orthopedic surgery, went to Kenya to help teach doctors about sports related injuries. The article acknowledges Kenya's lack of medical equipment and trained physicians in SEM, and Dr. Cole wanted to be the solution. By bringing his experience as well as 500 pounds of medical equipment, he has begun to help Kenyan doctors and surgeons properly treat aspiring Kenyan sportspeople. Many sportspeople have to suffer the consequences of injuries, simply because the doctors in Kenya do not know how to treat them. Sports injuries are taken less seriously than common physical injuries, and it puts a large burden on sportspeople trying to reach their full potential. Dr. Cole quotes "I hope to leave behind a legacy of sports medicine trained physicians who will continue to change lives" and these are very powerful and promising words that could help shape SEM in Kenya. Foreigners coming to Kenya, even for a short time, can have an incredible influence on SEM and physiotherapy, and hope this trend will continue [9].

Kenyan footballers suffering thanks to lack of basic education

Robert Osoro

Robert Osoro has a very informative article about why the progress and level of Kenyan football has halted, and his argument is the lack of education of footballers. Many Kenyan footballers lack a even a basic education, and this ends up hurting them in the long run. This has a major effect because many footballers- some with potential to play in Europe- get injured, but do not know who will take care of their medical bills. Most footballers do not sign contracts- they just verbally accept to play for clubs- so when they get injured the club does not cover them at all. They do not know anything about the legal process, they know nothing about how to navigate and receive a favorable contract, and so a minor injury can end their bright careers. With more educated footballers, they could make better decisions for themselves and ensure that they are getting the proper coverage, and can defend themselves legally [11].

In sickness and health? Not so for Kenyan Premier League clubs and their players

Isaac Swila

Isaac Swila writes a phenomenal article about medical coverage for Kenyan Footballers. His claim is that many footballers, like the previous article stated, accept verbal contracts, but there are more than enough footballers who sign formal written contracts. Swila states that upon signing, "*The player agrees that: The club is entitled to know the medical status of the player and reserves the right to order further medical tests. The player should report immediately to the relevant authorities any injuries sustained while on the course of duty to the club. The club shall provide full treatment both as*

an in-patient and outpatient in case of injury while playing for the club.” This should absolutely give the player the confidence and hope that his/her club will look after their physical well being, however, this is not the case. Many football clubs, even though the player signed a written contract, will look the other way once the player gets injured. For example, former Tusker FC player George Opiyo picked up a knee injury during training, and after adequate treatment, Tusker FC simply broke Opiyo's two year contract and let him go. When Opiyo argued, the club stated that it was a mutual agreement and that he was not even getting any playing time for the club. Tusker FC stated that they were willing to settle any medical expense he had, but in reality they let him go because they did not care enough about the player to pay for his bills. When Opiyo joined Sofapaka a few months later, the chairman of Sofapaka refused to pay him stating that the player had come into the team with an unknown injury and “did not deserve a penny”.

Another example of a footballer getting no love from his club is Japheth 'Jojo' Waweru, the former Tusker FC centre half. Waweru, a towering and talented defender, and was beginning to emerge as one of the greatest Kenyan centre halves of his generation. Unfortunately, he fractured his neck during his time with Tusker, and no one at the club seemed to take notice and give assistance. Waweru continued to play, and was invited to play at the 2014 African Cup of Nations as the starting centre half. Sadly, he left the match when he appeared to have a 'serious neck injury'. Tusker dropped him shortly after, he never found another top flight club to play for, and now has taken to the bottle and lives in poverty.

Former AFC Leopards and Nigerian national footballer Henry Gentle sustained a metatarsal injury in 2010, and with no help from his club, missed the remainder of the season. A metatarsal injury should only last 1-2 months, but his injury time was much longer due to the club sacking him from the team and refusing to assist with the medical bills. Luckily, family, friends, and fans came to his rescue. Wayne Rooney, a famous English footballer playing for Manchester United in England had suffered a

metatarsal injury, and his club paid for his treatment and he was only out for a few weeks.

Gor Mahia forward Paul 'Modo' Kiongera received a serious knee injury and stated that his club showed no genuine interest in helping him. Although Swila states that he had several sessions with the club's physiotherapist, Kiongera believed that he needed to consult other medics to decrease his injury time. He is absolutely right, since physiotherapists have several restrictions, but more specialized doctors (such as SEM doctors) do not. Gor Mahia did not help him with this, and took no interest in the unfit Kiongera. Once Kiongera healed, the club appreciated him much more. Many premier league clubs give attention to fit players, and pay no attention to unfit and injured players. A massive problem in Kenya is that it is often times cheaper to look for a replacement player than to help assist the original injured player. Unless the original player is of top quality, that player will typically get no assistance from his/her club.

As Swila points out, there are serious problems with how footballers are treated by their clubs when they receive injuries, and four prime examples are given. Many more players in Kenya get injured and become faceless and meaningless and no one ever seems to notice. However, there is definite promise that this will improve, and this can be seen by former Thika United midfielder Nicholas Muyoti. He suffered a metatarsal injury while playing for Thika, and even though Thika did not have a specific medical plan for its injured players, they worked closely with Muyoti and sent him to South Africa for treatment. The midfielder returned in ample time and had very positive things to say about his experience. Therefore, Kenyan clubs are definitely capable to provide coverage for their players, it is just a matter of time and effort [13].

Knee Injuries in Elite League Football During One Season in Kenya: Preliminary Results

Dr. Vincent Mutiso

Dr. Vincent Mutiso, the Kenyan Football National Team doctor and certified orthopedic surgeon did a study on knee injuries during a season of top flight football in Kenya. Mutiso talks about how many of these footballers came from a financially deprived background and how any type of injury could produce risks for their future livelihood. This is how they make a living, and without other resources to help them, football becomes a very risky sport to play. In addition, very little information about sports injuries comes out of Africa compared to the rest of the world. Mutiso recorded a total of 327 injuries during the season, with 57 of them (17.4%) of them being injuries to the knee. Unfortunately the specifics on the type and severity of the injuries was not given in this particular source. Regardless, 327 injuries is a very high number, and at least a good portion of them presumably were time-loss injuries. Mutiso strongly believes that better data needs to be taken and kept regarding injuries in sports, so that they can “translate it to injury prevention efforts in addition to the medical management of these injuries” [8].

Injury surveillance during a 2-day national female youth football tournament in Kenya

Marianne Lislevand

A group of Norwegian sports scientists from the Oslo Sports Trauma Research Center in Norway came to Kenya to observe and record all the injuries that occurred during a two day football tournament hosted by MYSA. 14 different people served as injury recorders and classifiers during the female youth tournament, with four physiotherapists and two doctors supporting them. Exactly 938 females participated in the event, with three different age groups (under 13, 13-16, and 16+). The

results were very well recorded, with 121 injuries recorded in 106 matches. Fortunately, most of the injuries- 98 of 121 (81%)- allowed players to immediately resume playing. These injuries included minor nicks, scrapes, and getting kicked. 15 players received a bit harsher injuries that sidelined them for the rest of the game, but were able to come back the following game. Six players received injuries that were likely to keep them out for 1-3 days, and two girls received injuries severe enough to keep them away for 4-7 days. Luckily, there no major injuries occurred that would sideline a player for over a week.

Girls under the age of 13 were twice as likely to get injured compared to those over the age of 16. This likely has to do with stronger muscles and bones in females over the age of 16. The areas of injury were most common in the knee (25%) and the ankle (19%), and with lower limb injuries constituting 82% of all injuries. The most common injury was different contusions- bad bruises usually due to impact- in the quadriceps, hamstrings, and calf muscles. 79% of all injuries were due to contact, which shows just how dangerous playing football can be. In addition, almost all the girls who were injured lacked proper equipment, such as football boots and shin guards. Only 10% of girls had shin guards, and 73% of players owned football boots. This is both a good and bad thing, because although Kenya severely lacks proper equipment for the youth, if equipment was present, very few injuries would have occurred at the youth level. In conclusion, many minor injuries occurred during the tournament, but this was due to lack of proper equipment. No player received a major injury, so the tournament was very safe and successful [7].

Methodology:

This independent study project was carried out primarily by personal interviews and extensive secondary source research. Overall, seven different personal interviews were done in Eldoret and Iten, and eight personal interviews were done in Nairobi. No official interviews were done with specific athletes and footballers, but very quick conversations occurred. In Eldoret, interviews were had with an orthopedic surgeon at St. Luke's orthopedic and trauma hospital, a physiotherapist from Moi Referral (who also worked as a physiotherapist at the famous training camp run by Gabriele Rosa), the manager of a high altitude training camp, the coach of the same camp, and a former NCAA champion runner and sports marketer in Kenya. In Iten, the coach of a running development academy and a physiotherapist dealing with high level athletes were interviewed. In Nairobi, seven interviews occurred at MYSA and one occurred at a KPL football match. At MYSA, interviews occurred with the two MYSA directors, one KPL team physiotherapist, the head physiotherapist at MYSA, two KPL coaches (on the same team), and one football specific weight trainer. At the match, another team physiotherapist was interviewed. Each of the 15 total interviews was at least 20 minutes, with many even going for over an hour.

Key informants included the physiotherapist at Moi Referral, because not only did he give a public hospital perspective, but he also spoke great deal about the experience of training camp physiotherapists. His versatility provided very useful in helping this project move in the right direction. The manager of the high altitude training camp was another key informant, because he spent 3+ hours giving a tour of the camp, talking about everything related to his camp and training camps in general, and bringing the coach in to talk as well. At MYSA, both directors were very important and helpful, explaining a variety of projects that MYSA does, and catering their knowledge to this project. Lastly, the team physiotherapist at the football match was very helpful, providing a hands on personal experience of SEM in Kenya. Along with good secondary research, this project was very successful.

Findings and Analysis:

I. Most common injuries seen among athletes and footballers:

Even though the focus of this independent study project is to study the methods of treatment for athletes and footballers, it is very important to first know and understand the most common injuries seen among these people. If the common injuries are known, it becomes much easier to understand why certain methods of treatment are present and why some are not.

In athletes, the most common injuries, as told by two different track coaches, are overuse injuries such as stress fractures, sore/tight muscles, muscle sprains, sprained ankles, shin splints, damaged achilles tendons, torn cartilages, and inflammation in different parts of the body. Long distance athletes run an incredible amount, and all these kilometers have a serious toll on their body. Their muscles can easily get sore, their bones can crack and get weaker, and inflammation can rise. During the rainy season, when many of the running trails are underwater, it is very easy to slip and sprain an ankle or knee. Luckily, many of the injuries received by athletes are minor, and they are injuries that rest, time, and occasionally physiotherapy can heal. Very rarely does an injury involving surgery occur, which is a very positive thing.

In football, the most common injuries, as told by two Kenyan Premier League team physiotherapists and a KPL weight trainer are hamstring issues (usually tears), lateral ankle injuries, knee injuries, quad contusions, and quad and groin muscle pulls. More recently, head and shoulder injuries have become a problem as well. One major problem that footballers face that athletes do not is injuries due to contact. Most ankle, knee, head, and shoulder injuries are a result of contact injuries, and these contact injuries tend to be much greater time-loss injuries. A pulled groin muscle or torn hamstring would rule out a player for a maximum of one month, whereas a broken ankle would be 6-8 weeks, a torn ACL would be 10 months, and a serious concussion could even end a players career. In addition, many football pitches are of very poor quality, and especially during the rainy season there

could be potholes and slippery grass which could easily injure a joint such as the ankle or knee.

Football is a sport that involves quick bursts of running, abrupt stopping, and harsh cutting from one direction to another. All these movements, plus contact with other players, makes football one of the most injury prone sports. Fortunately, available methods of treatment have greatly improved in Kenya in the last few years.

II-1. Available methods of treatment for athletes:

Public Hospitals:

Moi Referral Hospital in Eldoret was visited, and more specifically the Memorial Private Wing, where the physiotherapy clinic operates. Both the head of the physiotherapy clinic as well as an experienced physiotherapist were present and available to answer many questions [14]. In addition, they gave a tour of the physiotherapy clinic and explained the different machines and equipment that are currently being used in the clinic. They explained different types of treatment that are given to people that attend the clinic. One important piece of equipment used is a traction machine. It is used for patients with fractures and stress fractures, usually femur fractures (which are very common in athletes and common people alike). The traction machine takes the leg and attaches a weight to it. The leg hangs off the bed to help slowly heal to bone and put it back in place. Patients will come in every day or every other day for 1-2 months and use the machine for about 30 minutes at a time. The traction machine is effective, but with proper surgery, the same injuries could be healed in a few days. Another machine used is the ultrasound. The ultrasound machine uses a probe with ultrasonic sound waves to produce a deep heating locally in the body (although not felt by the patient). In addition, the ultrasound is used for increased tissue relaxing, scar tissue breakdown, and local blood flow. Increasing the local blood flow will help decrease inflammation and also help heal bone fractures. The ultrasound usually lasts around 3-5 minutes at a time, and is a quick, painless, and effective way to help heal the body. The clinic also had a shockwave machine, which is very similar to the electrical muscle stimulation (stim)

that is present in the United States. The machine consists of two big pads that a body part can fit in between. An electrical pulse is sent throughout the specific area, as well as heat, which helps loosen the muscle area. It is a very effective machine when used properly. The traction, ultrasound, and shockwave machines are the three main pieces of equipment used in Moi's physiotherapy clinic. Ice is also present, but no weights, therapy bands, foam rollers, or balance beams are present in the clinic. The clinic is meant to be one of the best and most advanced clinics in the country, however, that was not the case.

The physiotherapy department has requested more and better therapy equipment, but the higher ranking officials have done nothing. The orthopedic department was not visited, but they mentioned that they have only basic surgery tools and equipment available for the patients. The radiology department has x-ray machines to take pictures of bones and joints, and it also has Computerized Tomography (CT) scanners which take closer x-ray images at different angles to create cross-sectional photos of bones, joints, blood vessels, and soft tissues in the body. Moi does have good pieces of equipment and staff, however, many athletes have a stigma against public hospitals, so most of them do not come and get surgery and many do not even come and get physiotherapy treatment. There is little trust in these physiotherapists, surgeons, and radiologists, and the reasons are unknown. No doctor specializing in SEM is present at Moi. With little trust in the staff and basic facilities and equipment, Moi Referral does not serve as a reliable place for athletes to go.

Private hospitals:

Upon the visit to St. Luke's Orthopedic and Trauma Hospital, the director and founder of the hospital was interviewed, who was also an orthopedic surgeon [15]. The hospital was created in 2012 and its goal targeted giving better and more specialized care to those who suffer from traumatic and physical injuries. With six orthopedic surgeons and four physiotherapists, this small private hospital adjacent to Moi Referral is a better, more local and more specialized place for athletes to get treated. A

hospital of this quality had not been available for athletes, who previously had to either go abroad to get proper treatment or suffer the consequences. St. Luke's has all the equipment that Moi Referral does, and with private funding, even more. Their physiotherapy department is much larger than Moi Referral, and includes weights, therapy bands, balance beams, medicine balls, and jump ropes. There are mats for stretching, and the overall facility has much more to offer. Unrelated to the visit, I have heard people who are not impressed with St. Luke's because of the lack of expertise with the staff, but in terms of equipment offered, St. Luke's is much better. In their orthopedic and radiology departments, St. Luke's is much better for athletes than Moi because St. Luke's offers minimally invasive surgery, and more specifically arthroscopy surgery. In fact, it is the most common surgery performed on athletes, because arthroscopies are done when a person has damaged cartilage, tendons, ligaments, buildup of inflamed tissue and fluid, and displaced pieces of bone. Therefore, arthroscopies can heal many of the common injuries of athletes. Most injuries that athletes receive can be treated by physiotherapists, but heavy damage to places like the knee and ankle can be solved by surgery. Luckily, with St. Luke's ability to perform arthroscopies, most athletes do not have to travel far. Arthroscopies are vital to an athlete because they only take 15-20 minutes to perform the surgery, and the healing time is only six to eight weeks. Only two small holes are cut in the skin, one for the arthroscope- a straw like metal tube with a video camera in it- and the other is for any surgical equipment that can be used to flush out any tissue damage, fluid, or inflammation. If an athlete gets an injury in any joint- most commonly in the knee- they can get this type of treatment instead of having to get their knee entirely cut open [10]. This open surgery would rule them out of their sport for half a year or more, which can severely hurt their careers. Open surgery is also much more dangerous, since the joint is completely cut open and is at a higher risk of getting infected and damaging nearby nerves. The orthopedic surgeons are also able to perform other types of orthopedic surgeries including total knee replacements, hip replacements, and bone fracture surgery.

Many of the surgeons at St. Luke's are also at Moi Referral (and come to St. Luke's only when needed), so the quality of the surgeons is not much better at St. Luke's. However, St. Luke's has better equipment and more money overall, so it serves as a better place to get surgery and physiotherapy treatment, if someone can afford it. A typical arthroscopy surgery is around 200,000 KSH, with other surgeries costing even more. At Moi Referral, surgeries tend to range from 10,000-20,000 KSH. One physiotherapy session at St. Luke's goes for 1000 KSH, while at Moi it is only 200 KSH. Although the level of training of the staff (physios and orthopedic surgeons) might be the same in both hospitals, the quality of equipment used affects the overall treatment, and therefore it costs more. Sadly, since treatment at St. Luke's is so expensive and there is a strong stigma against public hospitals such as Moi Referral, athletes with little money end up fighting their injuries on their own.

Training Camps:

The training camps in Eldoret and Iten range in several categories. The main difference is the amount of funding that goes into each camp. Camps that are well funded tend to be bigger, with better equipment, infrastructure, staff, and overall quality of athletes. The best example of this is Lornah Kiplagat's camp in Iten. Being a world champion in athletics with several connections, Lornah Kiplagat has started a training camp that is well funded by sponsors all across the world. The training camp has a state of the art 400 meter track, luxurious rooms, and mostly importantly a world class physiotherapy department. Gerard Hartmann, arguably the world's best physiotherapist for athletes, has worked with and treated several world class runners including Lornah herself. He has partnered with Lornah and in 2011, they created the Hartmann-International Sports Injury Clinic at the training camp [3]. This clinic is the epitome of physiotherapy treatment for the athletes. This clinic has all the best equipment, world class physios, and overall great care. With the exception of injuries that require surgery, this clinic can ensure maximum recovery in a short period of time. Unfortunately, neither Gerard nor Lornah could be contacted, so the visit to the camp did not occur.

Another top quality training camp that has exceptional physiotherapy services is Gabriele Rosa's camp in Eldoret. Although Rosa and his sons have been away for a few months, the physiotherapist from Moi referral had worked at the camp for two years, and had plenty to say. He explained the emphasis Rosa puts into rehabilitation, and why his physiotherapy clinic at the camp is top notch. It has medicine balls, mats, therapy bands, and balance boards. The clinic is run entirely by physiotherapists, and the most common forms of treatment are massages for sore/tight muscles, icing, strengthening with therapy bands and medicine balls, and rest. The clinic has an ultrasound and traction machine, but the special machine they have is called a Tecar Therapy machine. It is a newly invented electromedical machine that is used for the prevention of injuries, rehabilitation of muscle tendons, and easing of pain. The machine uses electrodes or probes to create three different types of energy- mechanical, chemical, and thermal- to help the athletes. The mechanical energy is used for displacing fluids, which can increase circulation and help heal the injured body part [14]. The chemical energy is used for recalling oxygenated blood and that helps boost the metabolism of damaged cells. The thermal energy is used for deep tissue heating and to help the movement and mobilization of the damaged tissue. The versatility of this machine is incredible, and even more fascinating since it can be used as a preventative measure. Many athletes tend to be sidelined because of nagging injuries that keep persisting, or a minor pain that ends up exacerbating and becoming major. With the Tecar Therapy machine, it can be used during the acute stages of injury and can be very beneficial in preventing a long term and more serious injury.

Even though these camps sound promising, these are the high end, expensive camps that many athletes cannot afford. A single month in the Rosa camp in Eldoret costs around \$200. For amateur athletes that have never won any big races and made large sums of money, they cannot afford this. Many of them choose to go to smaller training camps because they are cheaper, but these physiotherapy services do not exist at these smaller camps. One camp that is small and not very well funded is the

High Performance Training Camp founded by Kipchoge Keino. This camp was once the hub of elite athletes, but recently due to various reasons, it has decreased in size to only 15 athletes, all who are amateur runners. With little funding from the IAAF and IOC (the original and current sponsors of the camp), the manager, has not been able to create a physiotherapy clinic or even hire a full time physiotherapist at the camp [18]. He has bought some equipment such as weights and ice packs, but he relies heavily on the coach to keep the athletes away from injury, because there really is no plan B. After speaking with the coach, his 'sports and exercise medicine' strategy is to keep his athletes as far away from injury as possible [17]. For preventative methods, he does a lot of stretching and strengthening with his athletes. Using a hill, he does plyometrics which are a combination of both stretching and strengthening. He incorporates runs with objects such as large tires to help strengthen the body while doing cardio as well. One of his best forms of treatment is taking his athletes to the nearby pool in the early morning, when the water still is very cool. This way, athletes can exercise with no form of weight bearing movements, and they can also let the cool water heal the body. When an athlete does get injured, ice and rest are the main forms of treatment. Occasionally, a physiotherapist will be brought in, but mostly for massages of sore and tight muscles.

Development academies:

There are only three development academies in Kenya, where coaches train athletes from a young age up until they reach their early 20s. The main academy is run by Brother Colm O'Connell, otherwise known as the godfather of running in Kenya. He has trained many young athletes, with incredible success. Some notable runners that he has coached/still coaches are Lornah Kiplagat, Edna Kiplagat, Ibrahim Hussein, and David Rudisha. Brother O'Connell gave a very nice and different perspective about how coaches treat their athletes. He does not really use physiotherapy unless absolutely necessary because he believes that people should not get too dependent on assisted services [19]. He grew up without physiotherapy, so he understands training and coaching with no plan B, and

that is how he has continued to coach. By paying close attention to his athletes, he can detect when an athlete is facing some pain or a nagging injury. He does not hesitate to rest his athletes, and does not push them too hard. With enough rest and with basic methods such as icing and stretching, he believes his athletes will be okay, and he has not seen any serious injuries in his 35 years of coaching. By incorporating plyometrics and pilates into his workouts, and by gradually training his athletes, he has seen incredible results, without facing any serious injuries.

II-B. Available treatment for footballers:

Mathare Youth Sports Association (MYSA) Offices:

The most informative place of visit was the Mathare Youth Sports Association (MYSA) offices in Nairobi. MYSA is an organized that takes 40,000 youth players and gives them an opportunity to play football while also teaching good habits such as the impact of education and recycling. In addition, MYSA has its own Premier League team, Mathare United, which is one of the best in the KPL. The MYSA offices consist of a complex that includes a full sized dirt football pitch, a small turf pitch with walls, and a state of the art gym with physiotherapy services. Unlike many football leagues, MYSA and Mathare United allow other Kenyan football teams to come and train at the complex, and for a much cheaper price than most gyms/private physiotherapy clinics. Some of these teams that come include Premier League sides Sofapaka, Gor Mahia, and AFC Leopards (3 of the best teams in the league), FKF team Posta Rangers, and division one teams Mumbi National and Kayole youths. These teams come to work out and use the gym, as well as receive physiotherapy treatment from the MYSA trained physiotherapists [21].

MYSA is incredibly special because they train physiotherapists in 11+, the FIFA created and approved injury prevention and treatment program [22]. The physiotherapists are trained at MYSA by two world class dutch physiotherapists- Erwin Jansen and Harald Bant- and train as completely football specific physiotherapists, which makes a major difference. The handbook created by the Dutchmen is

very informative, in depth, and well thought out. They define an 11+ physiotherapist as someone who is competent in three categories: a specialist, innovator, and advisor [21]. The specialist is meant to be well versed in all football injuries and can specifically treat footballers in an efficient and professional manner. The innovator-part of a physiotherapist must be able to invent and create new exercises on the spot for the footballer to do, based on how the footballer feels and the progress they make. The advisor uses teaching methods to help the footballer understand what is happening to them, why they are doing these exercises, and advising them on preventative methods for the future. Their five main roles include diagnosing the issue, providing first aid if necessary, promoting health and preventative measures, treating and advising injuries, and professionally collaborating with coaches, players, clubs, and others. Many hospitals in and around Nairobi have physiotherapists, but most of them are accident or general physiotherapists, and their training is much different and does not help the footballers. MYSA has over 30 qualified 11+ physiotherapists and continues to educate many more aspiring 11+ physiotherapists. Since MYSA is the only place in Kenya that trains football specific physiotherapists, the KPL has taken full advantage of this (in a good way). Many of these MYSA trained physiotherapists become traveling team physiotherapists for many KPL and FKF and division one teams. Some stay at MYSA and work with the youth, and others work with the public. There are many physiotherapists at MYSA who receive individual footballers from different teams and leagues who are recovering from an injury.

MYSA is the hub for all sports and exercise medicine issues in Kenyan football. Any footballer who receives an injury and needs physiotherapy services will come to MYSA. The physiotherapists and gym are of the best quality, the cost is cheaper than any private hospital and just as cheap as public hospitals, and there are no waiting lines. Any footballer who needs physiotherapy services will get immediate attention at MYSA. According to the head physiotherapist at MYSA, who works with the public, the MYSA youth, and a variety of professional footballers, it only costs 500 KSH per physiotherapy session, and these footballers (among others) get the best quality service [27]. Most

players usually have minor time loss injuries or are recovering from a major surgery. After observing this physiotherapist work with an injured footballer for about an hour, the quality of the session and professional treatment given was superb, and much better than previous expectations. The gym is equipped with several rehabilitative tools, such as beds for icing and massages, therapy bands, mats, balance beams, and stepping stools. The physiotherapist knew exactly what to do, exactly how hard to push the injured athlete, and gave full attention to the footballer. Therefore, unlike many places in Eldoret and Iten, sportspeople in Nairobi have affordable and high quality treatment at MYSA. According to the physiotherapist, in the few years that he has worked at MYSA, there was not a single injury that they could not attend to [27].

Since the MYSA physiotherapists get trained in 11+, which places a high focus on injury prevention, the state of the art gym in MYSA is used by many football teams to help prevent injury. There is a weight trainer at the gym, who at the request of the coach, takes several football teams and gives them gym workouts to do. For about 90 minutes, the KPL team AFC Leopards workout at the gym, and observations were made. The coach has requested a cardio day, and the trainer took them through an intense warmup, followed by a serious of calisthenics and plyometrics. Some of these exercises included step up lunges, burpees (going down to do a pushup followed by springing up and jumping), jump squats, inclined pushups, and more. The weight trainer was very skilled, knew exactly what he was doing. Not only was his workout an intense, calorie-burning session, but he specifically incorporated muscle building and stretching exercises into the workout. Footballers who have more muscle, more flexibility, and overall greater fitness have a much lesser chance of getting injured. His addition of weights into the training is very important, since weight lifting helps densify bones and helps prevents bone fractures and joint problems. To conclude the workout, the trainer did a serious of core exercises, which is arguably the most important section of the body to strengthen, and finished off with a long and easy stretch. Other workouts that the trainer does (but did not do with AFC Leopards)

include more muscle endurance and muscle building exercises. These workouts are usually done during preseason, to make sure the footballer is strong and well built. The gym has bench presses, squat racks, weight machines, free weights, stationary bicycles, and a pull up bar. A better gym could not be found in Nairobi, and with a price of only 4500 KSH per session (and even less for lower level teams), many football clubs can afford this [26].

While talking to the coach of AFC Leopards, a great deal about the SEM aspect of football was gathered. He explained that most footballers sign contracts without considering the coach or other aspects, and the footballers do not realize the impact the coaches have, especially on the players health and well being. The coach controls how hard and often the team trains, how often they lift weights and do rehabilitation exercises, how much rest they receive, and he/she is the first one to detect an injury in a player [24,25]. According to the Leopards coach, about half the coaches in the KPL take care of their players and try to minimize injury by giving the players rest, taking them to places like MYSA for weight training, and overall caring about their well being. However, the other half tend to work the players too hard. They only expect results and do not understand the power of relaxing and giving the players the rest they need. The body can only perform at the highest level if treated properly, and without proper recovery and rehabilitation, the body will not ever be at its peak. That is why, according to the coach, the 50% of coaches who understand the importance of recovery and injury prevention are the coaches of the top teams in the KPL. This makes complete sense because come game time, these footballers are well rested, injury free, and full of energy.

Two different team physiotherapists from Gor Mahia and Mathare United, who both trained at MYSA, also gave great information [21,28]. They both spoke highly of their clubs coaches, stating how much care the coaches give the players and the time and money they are willing to spend on weight lifting sessions, physiotherapy for their players, and overall emphasis of rest and recovery. Additionally, the coaches have the physiotherapists talk about the importance of nutrition to the

footballers, which can greatly help prevent injuries. By consuming high levels of calcium, vitamin D and vitamin D3 (milk, cheese, supplements), the footballers will have strong bones that will help prevent fractures and joint problems. Eating nuts, dates, green vegetables, and cocoa can help increase iron levels, which helps blood circulation and provides energy to the footballers when they need it most. Eating large amounts of protein is very healthy because this helps rebuild muscle tissue and re-strengthens the body. Eating protein after a workout or game is very critical. Also, avoiding alcohol, especially after an injury, is very important because alcohol promotes inflammation and weakens the body's brain to nerve cell connection. Most KPL clubs cannot afford a nutritionist, so many physiotherapists share what they know in order to help the players avoid injuries and help recover quickly. Another natural form of recovery is the heat and tropical weather that Kenya has. One woman who plays for FC Cologne in Germany came to MYSA a few years ago [28]. She got her surgery in Germany, but came to Kenya for rehabilitation. The high quality of physiotherapy that MYSA has plus the warm climate allowed her to heal in a very short time. The idea of European footballers coming to Kenya for treatment has never crossed my mind, but the fact that it happened and that the European clubs trust places like MYSA is a very good sign for the future.

Hospitals: Public vs. Private

According to the two team physios, there were only three major injuries that occurred last year in the Kenyan Premier League [21,28]. That number is incredibly low, which is a wonderful sign. Each of those injuries required knee surgery, which cannot be done at MYSA. Fortunately, the MYSA and 11+ physiotherapists can help footballers by referring them to good and reliable places to surgery. MYSA has connections with four different hospitals, two public and two private. The two main hospitals that MYSA refers its youth and professionals to are Mama Lucy, a public branch of Kenyatta National Hospital, and Komorok Modem, a private hospital in Nairobi. Both hospitals have very good equipment- MRI scans, CT scans, minimally invasive surgery methods, and good orthopedic surgeons.

Most footballers who need general surgeries will go to either of these hospitals. Both hospitals are good, but Komorok Modem has a much shorter waiting line, since it is a private hospital. However, it is more expensive, so it is up to the football club and MYSA to decide where the footballer will go to get surgery. In Nairobi, knowing the right doctor/surgeon to perform the surgery is just as important as the quality of medical equipment and technology, to ensure a safe and efficient surgery. Another very good hospital with state of the art surgery and SEM equipment is Kikuyu Central Provincial Hospital in central province. Although it is a provincial hospital, many players who live outside Nairobi will choose to go there to get surgery. According to the physios, it is a very reliable and safe place to go. The fourth and best place to go for surgery is Nairobi Hospital, a private hospital in Doctors Plaza in Nairobi. MYSA has a great partnership with arguably the best sports-focused orthopedic doctor in the country, Dr. Vincent Mutiso. Dr. Mutiso trained in the United States, and returned to Kenya to help provide reliable and safe treatment to even the most difficult surgery- required injuries. He currently serves as the team doctor and orthopedic surgeon for the Kenyan National Football Team, and is the most reliable person for surgical procedures. He has treated several footballers in the past with incredible success. The only issue is the high cost- due to the high quality- so MYSA only refers people to him when the injury is very delicate. An MRI scan at Nairobi Private Hospital would go for around 20,000 KSH and surgery done by Dr. Mutiso would be anywhere between 60,000-300,000 KSH. Other hospitals would have cheaper prices, but with expensive prices comes great quality. Unlike Eldoret, the hospitals in Nairobi (both public and private) have the proper equipment, medical knowledge and technology, and it is just a matter of affording it and waiting in line [22].

Football Match:

It was a blessing to be able to attend a football match at Nyayo stadium- the main football stadium in Nairobi- between Mathare United and Muhuroni Youth. Observations were made based on the medical treatment available and the aftermath of a player going down during the game. On the side

of the field stood three Emergency Medical Technician's (EMT's) with a stretcher, clearly in case of any type of emergency occurred. Since knee and head injuries are common in football, it is crucial to have trained emergency professionals and a stretcher present. An ambulance was stationed outside, ready to take anyone to a hospital if needed. Both teams also had a physiotherapist present, and another person alongside them in to assist in case a player went down on the field. Luckily, they were only called upon four times during the game (combined), and no injury- major or minor- occurred.

In the middle of the stands was a balcony type seating area, where a doctor affiliated with the KPL sat and watched the game. Since some teams do not have a physiotherapist, and no teams have a traveling team doctor, this doctor is hired by the league to attend games and provide services if necessary. This was something unexpected, and it was wonderful to see, because now even low level teams without any physiotherapist have a medical professional to assist them during games. The doctor did not get called upon during the game.

Many positive observations were taken, but many issues remained. For example, during the game, whenever a player went down, they would just lie there until the referee came over and signaled the physiotherapist, which took a much longer time that it should. Once, during the game when a player went down, the referee (fortunately) immediately signaled the physiotherapist, and the physiotherapist was not even paying attention and had a delayed response to the situation. That is completely unacceptable and if a player goes down, every second is crucial in ensuring his/her recovery. The physiotherapist on Mathare United was well trained and had good responses to his injured player, but the training level of the Muhuroni Youth physiotherapist is unknown and questionable since he lacked attentiveness. Also, although uncontrollable, the football pitch was very wet and muddy, and this can seriously injure a footballer if they try to plant their feet and they slip. This is an unfortunate product of the rainy season in Kenya.

III-A. Explore methods to improve the medical knowledge, technology, and experience to help Kenyan athletes:

Hospitals:

After talking to several people, the major problem regarding SEM in athletics in Kenya is the lack of funding [14]. With proper funding, many of the issues that Kenya faces in developing SEM would be alleviated. With more money, public hospitals would have the ability to buy better equipment and get better infrastructure. At Moi Referral, the same orthopedic surgeons work there as they do at St. Luke's, yet St. Luke's is regarded as a much better hospital. If minimally invasive surgery equipment was available at Moi and the physiotherapy department could afford weights, therapy bands, medicine balls, and higher quality machines (like Tecar Therapy), Moi referral would be a tremendous hospital to go to, and many athletes would want to come. After speaking to a few physiotherapists at Moi, they have tried to get the government to provide better machines and equipment, but have been unsuccessful. In addition, many of Kenya's best orthopedic doctors choose to either work abroad or go into a private practice, usually because of poor wages for public doctors. With better wages, many doctors would choose to work in Kenya and in public hospitals, and this would increase the talent pool and overall trust that athletes have in public doctors in Kenya. With more experienced doctors in public hospitals and with better equipment, many athletes would get the reliable and affordable care they need. Another aspect is the development of SEM in Kenya. Not many people know about physiotherapy or SEM, with about 55% of the Kenyan population aware of physiotherapy and only 5% aware of SEM. With more awareness, medical programs for SEM would develop and SEM doctors would be prevalent throughout Kenya. Kenya does have good physiotherapy schools and orthopedic surgery programs, but no such program as SEM. Also, the cost to go to school for physiotherapy or orthopedic surgery is very high and not many people can afford it. The cost for a diploma in physiotherapy, with a government sponsor, is 60,000 KSH per year. Without a sponsor, it is 120,000 KSH per year. For a degree in physiotherapy, with a government sponsor, it is 80,000 KSH per year,

and 220,000 KSH a year without a sponsor [14]. A degree costs more because it involves less time in school, but even to get a diploma, one needs to dig deep into their pockets.

Training camps:

After speaking with the manager and coach of Kipchoge Keino's High Performance Training Center, funding is also the number one reason that a physiotherapy clinic does not exist at the camp [18]. This may sound unfortunate, but it is a very positive sign because it shows that many people understand the importance of physiotherapy and SEM, but just have issues making it happen. Many physiotherapists have approached the camp offering their full time services, but unfortunately there is no money to pay them. In addition, the money for better equipment is not available either. Fortunately, the coach has had years of experience and knows how to keep the athletes away from injury, without spending money. Aside from funding, education is another major factor that could help these athletes. Many athletes at the camp are not educated, and do not know about basic nutrition and concepts such as stretching. The coach does a good job of teaching the athletes, but many of the athletes just repeat what the coach does as opposed to understanding why certain things are beneficial to prevent and treat injuries. With improvements in educating the athletes and having them spread their knowledge to other upcoming athletes, the idea of SEM and the rehabilitation side of athletics will be much more prevalent.

Kenya has a rich history with expatriates coming in and bringing their knowledge to help enhance athletes. Brother Colm O'Connell did it when he realized that the high altitude of Eldoret and Iten would be the perfect training ground for the worlds top athletes. Another great example is Gabriele Rosa, who originally was a doctor in Italy who came to Kenya to help train some of Kenya's greatest marathon runners. Dr. Rosa also brought along his doctoral experience and used SEM, physiotherapy, and rehabilitation tactics to help his athletes reach their fullest potential and compete at the highest

levels [14]. Dr. Rosa also owns a running company in Italy, and the company can sponsor athletes and really support them financially, so these athletes can focus on running and succeed. Lornah Kiplagat, of Kenyan origin but currently a Dutch citizen that competes for Holland, is another example of someone who brought foreign experience and funding to Kenya, and does a wonderful job with her training camp. Expatriates have many connections internationally, and can help get sufficient funding from foreign organizations that can help athletes in Kenya. Expatriates are very important in the success of running in Kenya, and by increasing the number of expatriates and increasing the world experience and money that they bring, they can help the overall experience in running. In addition, expatriates who praise SEM and even those who have a doctoral background (like Dr. Rosa), would have a huge influence in the increase in use of SEM and physiotherapy and they would be able to bring in the proper machines and equipment that would help these athletes greatly.

Another major hindrance is communication. When I visited the High Performance Training Camp, one of the major issues was communication. This training camp sponsors athletes from all different countries, such as Rwanda, Taiwan, Palestine, Iraq, Burundi, and more, and communication can be difficult. Many of these athletes speak very little English, and no other common language exists. If not for the coach's keen sense of injury and his powerful observation of his athletes, many times it is very hard to detect injuries. Many athletes are hesitant to mention an injury or anything acute, and with a language barrier and without keen observations, it would be nearly impossible to help an athlete prevent an injury. It also becomes very difficult for the coach to teach the athletes about injury prevention when they cannot always understand him or her. With better communication (translators perhaps), this would not be an issue.

III-B. Explore methods to improve the medical knowledge, technology, and experience to help Kenyan athletes:

Footballers:

Fortunately, MYSA has taken the initiative to put SEM and injury prevention at the forefront of football, so unlike athletics, great progress has been made [22]. Now, the major event that needs to happen is the continuation and support of SEM through MYSA and other organizations and football clubs. MYSA ensures that all their players with injuries will receive medical coverage, and Mathare United also ensures that upon signing the written contract, these players will have their medical expenses (resulting from football related injuries) covered. Luckily, other clubs such as Gor Mahia, and Posta Rangers (among others but not confirmed) also provide medical coverage for their players, and this is a very positive move [27]. More teams need to follow this and legally offer contracts that medically cover their footballers.

In addition, more footballers need to be educated about the legal process of signing contracts, and make sure that they join teams that cover their medical expenses (if possible). Most footballers do not even consider this while signing a contract- they just join the club that gives them the most money- but it is such an underrated privilege. Injuries are very unfortunate events, and no footballer ever thinks it will happen to them, but if they do get injured, it is crucial that the club covers them. Kenyan footballers do not make nearly enough to pay for their own medical bills, especially if they need an expensive surgery. Some clubs help cover the costs for players, but many clubs do not cover the players at all. About 90% of clubs will verbally say that medical expenses will be covered, but when a player receives an injury and cannot pay for the treatment, many clubs will just drop him/her. They will make a case that their service was no longer needed, when in reality it was because they did want to or could not cover their medical expenses [27]. Since most footballers do not understand the legal process behind signing contracts, and often times verbally agree to play for a club, when injuries come, the club denies ever saying they will support the player, and always win since there is no legal/written contract stating anything. This leads to the abrupt end of many young and talented footballers who could have had a wonderful future in the sport. Until footballers reach the highest level and are educated enough to

join the right clubs, they are walking on thin ice. The clubs that provide medical coverage tend to be those at the top of the premier league, because their players are healthier and more fit, and they can excel. MYSA is a very open organization, and they have gladly allowed multiple football teams to use their facilities- at a much cheaper price as well- so more teams need to create better connections with MYSA. Money is tough so it might be hard for some teams, but the more teams that get connected to MYSA, the better off they will be.

According to the team physiotherapists, there also needs to be more MYSA trained 11+ physiotherapists in Kenya. There are only 30 properly trained 11+ physiotherapists in Kenya, and only four teams in the Kenyan Premier League- AFC Leopards, Gor Mahia, Sofapaka, and Mathare United- have properly trained physiotherapists [21]. With more physiotherapists trained by MYSA, more teams in Kenya can have properly trained physiotherapists, more physiotherapists would be able to work at MYSA, and the importance of physiotherapy and SEM would be better known throughout Kenya. MYSA is only really beneficial to teams in Nairobi, so with more 11+ physiotherapists, they could spread out, and even begin teaching 11+ in different parts of Kenya.

Similar to athletics, the increase of energized, educated, and motivated expatriates in Kenya would be very beneficial to increase the strength of physiotherapy and SEM in the country. MYSA has been so successful in training 11+ physiotherapists because of the two dutchmen- Erwin Jansen and Harald Bant- and their professional European expertise. With more foreign physiotherapists and sports focused doctors, the level of education and training would be greatly increased. Also, the inclusion of European coaches- such as the AFC Leopards coach who is Croatian- would greatly help as well. As previously stated, the coach decides how hard the players will train, how much rest they get, and if and how the players will receive treatment. With more European coaches in Kenya, they will understand the importance of resting and relaxation, and will work hard to get their players treatment. There has been controversy about employing too many European coaches, because people think it cripples

Kenyan coaches, and this is worth noting. However, even if the coaches are not European, it is important for Kenyan coaches to gain experience from Europeans and learn from them, since football in Europe is the best in the world.

In Nairobi, Kenya does not necessarily need to increase its level of medical technology and knowledge/experience present in hospitals, but they need increase the amount of it. There is only one doctor that MYSA 100% trusts- Dr. Mutiso- and there needs to be more doctors like him. If doctors of this quality would enter the public sector (although highly unlikely with the low wages), people could receive top quality treatment for minimal cost. Since medical technology is present in both public and private hospitals in Nairobi, it is important to train and hire the right people for the job. In other places of Kenya, however, both the level of medical technology and personnel in hospitals-both public and private- need to improve. Kenya has this potential- as seen in Nairobi- but it will not be an easy task. There is no easy solution for this, unfortunately, but as long as footballers can make their way to Nairobi for treatment, and their clubs assist in this process, they can receive proper treatment.

Lastly, people in Kenya need to understand the importance of SEM and physiotherapy, and how it can greatly help a footballer reach the highest level. During the workout session with AFC Leopards, a player stopped the exercise because he felt pain. The assistant coach ignorantly said that the player must feel pain to kill pain, which is simply not true. There is a difference between when the muscles burn and when the body is in pain, so no footballer should continue a workout if they experience pain, especially with weights. The footballer responded by saying that the assistant coaches statement is the African mindset, and he is exactly right. At the end of the session, when the players were cooling down their bodies and stretching, many players were not taking it seriously. Stretching is one of the most important and effective ways of preventing injury, but these players did not show any interest in taking care of their bodies. These players also take no interest in nutrition and what they should and should not eat, and these are all facts that can greatly help a player [26]. Players (minus this individual on the

Leopards) are also very hesitant to admit to injury. Often times coaches cannot detect if the player is pushing through an injury, until the injury has worsened to the point where the player can no longer play for a long time. Had that player been open and verbalized his/her acute injury, there might have been something the physiotherapist or coach could have done early on to prevent the injury from getting worse.

The rehabilitation mindset in football is severely backed up in Kenya, and this can also be seen by how KPL teams distribute their money. Many clubs make little money, and unless they have a good sponsor, the little money that is made gets put into players pockets [28]. This is very important, because professional players must make a living by this, but little to no money gets put into SEM and physiotherapy. Luckily, MYSA and Mathare have a wonderful sponsor in Britam insurance, and are able to have the finances and proper mindset to invest money in physiotherapy training and state of the art facilities. They can now profit off these facilities when other players and clubs come and train at MYSA, and everyone wins.

IV-A. Government Influence in Athletics:

Every person interviewed believes that the government has not done enough in the field of athletics, and has done nothing in the field of SEM. The government does a great job at the national level, covering medical costs, food and lodging, and equipment for the athletes, but they do not focus on any of the development aspects. They are only helpful once the athlete reaches the elite level and are good enough to represent the national team. They give zero money to any of the high altitude training camps, which means that all the training camps must rely on athletes paying them and various forms of funding and sponsorships. For the smaller training camps with little funding, the camps are very basic and have little to no physiotherapy services. With inexpensive prices to attend these small training camps, these camps generate very little money, and without public assistance, they will never be able to

provide the proper equipment, infrastructure, and professional personnel that these rising athletes need.

For public hospitals (Moi referral in particular), technically zero funds go to anything sports medicine related [14]. Some money goes to the orthopedic section, and even less goes to the physiotherapy department. The money allotted to these two departments is usually meant for the common person, and very rarely are athletes thought of. By realizing the importance of SEM and sports related physiotherapy, the government would be more inclined to give better funding. By law, the government is supposed to give a portion of its funds to the ministry of sports, who is in charge of providing money for everything sports related. I am not sure if the ministry would be in charge of the medical side of sports, because medicine and rehabilitation fall under another department, but the ministry can also do more by supporting and promoting SEM.

The government is not expected to fund these high altitude training camps- they are all privately owned and run- but if Kenya's biggest ambassadors and successors are athletes, why would more money not be spent on them? More specifically, why would more money not be spent on the developmental aspect of running, such as the training camps and youth development academies? In Europe, there are several development academies for football and other sports, and the government helps fund all of this. By aiding sportspeople at a young age, European governments reap the benefits when these sportspeople get older and do wonderful things for club and country. If the Kenyan government spent more money on the developmental side of athletics, they would definitely see more and better athletes rise to the forefront of world athletics (even more than they already do). Some of Kenya's top runners, as previously mentioned, came through one of the few development academies in Kenya, and their success has been clearly acknowledged and appreciated.

To add fuel to fire, many projects that the Kenyan government has set out to accomplish have not been completed. The primary example of this is the creation of Kipchoge Keino stadium. In 2007, the government had allotted 100 million KSH to upgrade and renovate the stadium (a previous one had

been built but of poor quality), but the money suddenly disappeared and the stadium still has not been finished [19]. This stadium would provide a state of the art 400 meter running track for the athletes, as well as a grass field in the middle in case athletes wanted a softer surface. As stated, a portion of government funds go to the ministry of sports, and they determine where it goes. However, Athletics Kenya, the main organization of running in Kenya, has had a problem with the welfare of sports in terms of maintaining the well being of sportspeople, managing injuries, and having a lot of disorganization and politics pervade the organization [19].

One source mentioned that he believes the biggest thing the government can do to improve SEM and physiotherapy for Kenyan athletes is to create a government run sports medicine clinic. There is a severe deficiency in the number of doctors specializing in SEM as well as qualified sports-focused physiotherapists in Kenya. If the government could create a sports medicine clinic in Eldoret or Iten, consisting of high quality sports-focused physiotherapists and SEM doctors, equipped with the best infrastructure and equipment, it would seriously benefit the athletes. Since it would be government funded, the charge to get treatment would be little to none. There are many issues with the plausibility of this, due to corruption and disorganization, that would make this project very hard to accomplish. Essentially zero money goes into sports medicine, and so to create a state of the art facility, brand new and effective equipment, and sufficient pay for high quality SEM doctors and sports-focused physiotherapists seems a bit far fetched. However, if this were to happen, it would be an incredible moment and enhancement for Kenyan athletes and coaches.

IV-B. Government Influence in Football:

The government has a massive role to play in the development of SEM and physiotherapy among footballers in Kenya. In terms of facilities, the government is responsible for providing the best infrastructure and medical equipment for public hospitals. They have done that with Kenyatta National Referral Hospital, as multiple people have mentioned that the facilities and equipment there are very

good. However, at other hospitals- like with Moi Referral- the proper infrastructure and equipment is not present. Footballers in Nairobi will benefit from Kenyatta, but there are many clubs outside of Nairobi that deserve to have good public facilities locally.

Many football clubs, especially in the KPL, are government/community sponsored clubs. Consequently, many of these clubs are among the poorest in the KPL, and perform the worst year in and year out. The reasons for this are simple: poor funding and lack of organization. As seen in the literature review, many clubs with private sponsors get a decent sum of money that can be given to the players, invested in good coaches and facilities, and used for developing facilities and personnel for SEM and physiotherapy. However, with minimal funding from the government, these clubs do not have any money for the players or for investing in a physiotherapist and a sports clinic. When the government is supposed to give money for the players, facilities, etc., the money gets lost somewhere in process, and these players suffer.

The government can also be a catalyst for the creation of better physiotherapy and SEM training for aspiring students. They could assist MYSA in training 11+ physiotherapists as well as creating areas for this training all over Kenya. Kenyatta hospital has a sports therapy program, but the physiotherapists produced there are of lower quality than the physiotherapists trained at MYSA. Kenya also does not have any medical program for students wanting to specialize in sports, so all the doctors trained in sports specialization (only a handful) received their training elsewhere in the world. If the government/management can do a better job of supporting physiotherapists and the idea of SEM in football, it would make a huge difference.

Lastly, the government needs to take better care of the national football team. The government does a good job with athletics at the national level, but not for football. The national team does not have the proper facilities and training to make them an African powerhouse. As the introduction stated, many coaches have had falling outs with the government, due to lack of money and services given to

the players, and this has stunted the growth of Kenyan football. Fortunately, the SEM aspect of football at the national level is very good, because Dr. Mutiso has been appointed as the doctor, and has taken very good care of the players [23].

V. *Media Influence in Athletics and Football:*

The media has an equal influence on both athletics and football. The media needs to make serious changes in both sports, and these changes are the same for both. First off, the media is too focused on results. The headline of every football article will be something like “League Leaders Gor Mahia Upset by Muhuroni Youth 0-1”. The media emphasizes scores, victories, statistics, and anything involving results. In athletics, the media will post articles about runners winning marathons, world championships, etc. However, that is the extent of what the media will say. There is absolutely nothing (several sports sections have been read) about the medical side of sports in any of the papers. The media does not mention if an athlete or footballer gets injured, they do not talk about the developmental side of athletics and football, and they consistently keep the public ignorant of SEM and the importance of it in the field of sports. The low level of journalism in Kenya is very prevalent with the way one-dimensional focus of sports.

The media needs to do a better job of covering injuries, plain and simple. In Europe, the when a sportsperson gets injured, that information shows up in the papers the next day. The article will mention the injury the sportsperson has, the medical process they will undergo, how long they are predicted to be out, and the doctors/physiotherapists that will treat them. This way, the public is well informed, there is pressure on the clubs/ teams and doctors to get the sportsperson back on the field, and that footballers misses as little time as possible. Also, the media very rarely visits high altitude training camps and football clubs, so they are unaware of the physical health of many of the sportspeople. The media needs to make a better effort to call on physiotherapists and doctors to talk about specific footballers and athletes, which is something they do very well in Europe. The media in Kenya only

visits right before a major football match or race, and they only care about the healthy sportspeople [16,18]. With this attitude, the media will continue to fail to cover sports injuries.

The low level of journalism in Kenya is very prevalent because the media is so focused on one aspect that they completely ignore others. An example of this is that the media does not talk about the development side of sports. Nobody knows what happens behind the scenes: The way sportspeople are medically treated, how they are getting paid, how they train, and the resources available to them. Many people are okay with the media unaware of what is happening, but it still would be important to highlight the injuries and really engrain the medical side of sports into people's heads. If the media talks about injuries more and does more follow ups with sportspeople on their injuries, the general public will understand the medical side of sports, and there will be better pressure on clubs, training camps, physiotherapists, and doctors to really help these sportspeople so they can live up to their highest potential (like in Europe). The media can have a much bigger impact that most believe because they are in charge of making SEM and sports-focused physiotherapy an important concept in the eyes of the Kenyan people, government, and sportspeople. With better media attention, SEM can really grow and develop in Kenya.

Conclusion:

Many people in Kenya do not know about physiotherapy, SEM and the medical side of sports in general. Most of the money that is generated for sports in Kenya gets 'lost' somewhere in the middle, and the little money that remains is aimed at going into the players and athletes pockets. Many Kenyan sportspeople, especially footballers, have to end their careers due to an injury that could otherwise be cured in places like Europe. The lack of attention, finances, and respect given to sportspeople is incredible high in Kenya, and it is a major concern. Many of these sportspeople use sports as a way to provide for themselves and their families, and they are walking on a thin line because injuries are

inevitable. As many people put it, success in Kenyan sports is the 'survival of the fittest'.

After completing the research, however, it was shocking with how much information certain people knew about the situation and how much knowledge they had about treating sports injuries. At MYSA especially, the directors and physiotherapists could assist virtually every footballer who came to them. If they could not treat the footballer, they knew someone who could, and usually had the resources to make it happen. The major issue now, however, is the low number of people who have this knowledge and information. If MYSA can expand its educated staff and increase the number of 11+ physiotherapists, Kenyan footballers will be in good hands. In addition, if Kenyan football clubs begin to take more interest in the medical coverage of their players, injuries will not be as devastating to a player and team, and the overall quality of football will increase within Kenya.

Unfortunately, there is no equivalent of MYSA for athletes in Eldoret and Iten, because running is more individualized there. However, as I have learned, the risk of injury for athletes is much lower and much less severe. Very few people- coaches especially- have seen severely injured athletes in their decades of coaching. Many good physiotherapists reside in Eldoret and Iten, and although the public hospitals do not serve as the most desired place for athletes to go, St. Luke's hospital has also emerged to be one of the more reliable places for some athletes to go. Furthermore, with the combination of low injury occurrence, new medical facilities, and spread out physiotherapists, many athletes can now get the treatment they need. Many of them (footballers included) must reach a certain level to make enough money to get physiotherapy services, but that is a risk sportspeople in Kenya are willing to take. Kenya still has a long way to go before the dominance of youth academies and medical coverage for youths exist, but Kenya is heading in the right direction. With the athleticism, drive, and passion that Kenyans have for sports, I have no doubt that they will emerge as world powerhouses, healthy as ever.

Recommendations:

I absolutely loved doing my ISP research, and what is very neat about sports and exercise medicine is that it is always changing, growing and developing. The information you get in a few years from online sources and different people may be very different than what I got. Therefore, I encourage any and all people to continue SEM research as an ISP. My biggest recommendation for anyone interested in sports and especially football is to intern at MYSA during the ISP period. Had I known earlier, I might have chosen to do that instead of my research (which I do not regret at all). The two MYSA directors are incredibly friendly and helpful, and when I visited the offices, they told me I could have stayed nearby with a staff member and could have worked with the youth teams, trainers, physiotherapists, and even some of the professionals. Not only would it be incredibly informative in learning about physiotherapy and SEM in Kenya, but it would be a blast as well. The progress of SEM in Kenya is rapidly rising, so many things could change between now and when future students come, and I encourage anyone interested in medicine and football to work with MYSA. MYSA also does many recycling projects, educational work, and other incredibly positive things for the community, so those not interested in medicine specifically should still look there to intern. It would be a very rewarding experience working with many underprivileged youth, but it would be just as fun and exciting to learn so many new things and play some football!

For those interested in running, I also loved my time in Eldoret. The weather is cool, there are no bugs, and everyone and everything is much calmer and relaxed. It is an incredible experience to go to Iten, where the world's greatest runners train. If you are interested in this aspect of the ISP, I would recommend contacting a training camp early on in the semester and staying (and training if you want) at the camp. You would be able to talk to athletes, coaches, and physiotherapists if they are there, and get plenty of information. It would be a wonderful few weeks.

Additionally, I failed to get enough information about the government and media influence of

sports in Kenya. A few good places to go that I could not are the Ministry of Sports in Nairobi, Athletics Kenya, various media outlets, and Kasarani stadium (where the national athletes and footballers train). By speaking to more government officials and journalists, more in depth information can be gathered. If you want a productive, informative, and fun ISP period, I would encourage you to continue sports and exercise medicine research!

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Personal Interviews:

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15. Orthopedic Surgeon, St. Luke's Orthopedic and Trauma Hospital, Eldoret, Kenya, April 16, 2015.
16. Running and Business Consultant, Keino Sports, Eldoret, Kenya, April 22, 2015.
17. Running Coach, High Performance Training Camp, Eldoret, Kenya, April 22, 2015.
18. Training Camp Manager, High Performance Training Camp, Eldoret, Kenya, April 22, 2015.
19. Running Coach, St. Patrick's School, Iten, Kenya, April 23, 2015.
20. Physiotherapist, Belio Field House, Iten, Kenya, April 23, 2015.
21. Physiotherapist, Nyayo National Stadium, Nairobi, Kenya, May 3, 2015.
22. Director, MYSA offices, Nairobi, Kenya, May 4, 2015.
23. Director, MYSA offices, Nairobi, Kenya, May 4, 2015.
24. Head Coach, MYSA offices, Nairobi, Kenya, May 4, 2015.
25. Assistant Coach, MYSA offices, Nairobi, Kenya, May 4, 2015.
26. Gym Trainer, MYSA offices, Nairobi, Kenya, May 4, 2015.
27. Physiotherapist, MYSA offices, Nairobi, Kenya, May 4, 2015.
28. Physiotherapist, MYSA offices, Nairobi, Kenya, May 4, 2015.

Appendix:

Interview Questions:

There were seven different categories of people that were interviewed. For footballers and athletes, since no formal interviews took place, many of these questions were not asked.

1. Athletes

Have you (or someone you know) been injured during training? How serious was the injury?

What did you do to recover? Where did you go?

Did you get sufficient treatment here at the camp? Were you charged money?

Did you need to go to a hospital to get treatment? Have you ever gone abroad for treatment?

What would you do if you were injured and could not afford treatment?

Do you know anyone that has ended their career because they could not get proper treatment?

Do you think the government is playing any role in the medical treatment of athletes, either positive or negative?

If you have received treatment, do you think it was sufficient? Did the physiotherapist or doctor seem well trained and helpful?

What can you say about the little media coverage involving athletes getting injured?

Do you think increased medical coverage and treatment would increase Kenya's already dominant power in athletics?

2. Doctors in Eldoret/Iten (athletics focused)

What medical processes do you use for athletes?

What types of injuries do you see?

Has there been any injury that you could not heal?

How much do you charge the athletes? What happens if they cannot afford medical treatment? Are accommodations made?

Are all the doctors well qualified and well paid?

Are sports doctors and physiotherapist accessible to those who need it?

How much does government spend on the athlete?

3. Managers of running camps

Do you see many athletes injured?

Do you help them with the medical recovery processes? Do you help them get referred to hospitals if they need to?

Is there medical equipment that they can use/ a clinic they can go to at the running camps?

Do you know anyone that has ended their career because they could not get proper treatment?

Do you think the government is playing any role in the medical treatment of athletes, either positive or negative?

What can you say about the little media coverage involving athletes getting injured?

Do you think increased medical coverage and treatment would increase Kenya's already dominant power in athletics?

4. Coaches of athletes

What happens when one of your athletes gets injured? What do you do during minor injuries? Major injuries?

What types of injuries do you see most frequently?

Do the running camps have adequate medical facilities and personnel?

Do you know anyone that has ended their career because they could not get proper treatment?

What preventative methods do you give your athletes to prevent injury?

Do you think the government is playing any role in the medical treatment of athletes, either positive or negative?

What can you say about the little media coverage involving athletes getting injured?

Do you think increased medical coverage and treatment would increase Kenya's already dominant power in athletics?

5. Footballers

Have you (or someone you know) been injured during training? How serious was the injury?

What did you do recover? Where did you go?

Did you need to go to a hospital to get treatment? Have you ever gone abroad for treatment?

What would you do if you were injured and could not afford treatment?

Do you know anyone that has ended their career because they could not get proper treatment?

Do you think the government is playing any role in the medical treatment of athletes, either positive or negative?

Does your team have a physiotherapist or doctor? How well trained and knowledge do they seem?

What can you say about the little media coverage involving footballers getting injured?

Do you think increased medical coverage and treatment would increase Kenya's performance in the sport of football?

Has your team done anything to support your injuries? In what ways have they or have they not?

Do you think better pitches and training/playing conditions would help prevent injury?

6. Physiotherapists/sports doctors in Nairobi

Have you dealt with many injured footballers before?

Were you able to treat them properly?

Were they able to afford treatment? What if they needed surgery?

What medical processes are used to treat these footballers? What equipment and machines are available?

Do you think there are enough physiotherapists (at the public health level)? How about sports doctors?

What can you say about the little media coverage involving footballers getting injured?

Do you think increased medical coverage and treatment would increase Kenya's performance in the sport of football?

Do you think better pitches and training/playing conditions would help prevent injury?

7. Football coaches

Does your team have a physiotherapist or sports doctor? What about a normal general physician? How many does the team have?

Have you ever had to serve as the physiotherapist/doctor?

Do your players get injured often?

Are they getting proper treatment? Are they getting assistance in paying their medical bills? Do they

sign formal contracts with the club agreeing them to proper medical assistance and coverage?

What happens to players who get injured and can't pay their medical bills and get no assistance from the club?

What can you say about the little media coverage involving footballers getting injured?

Do you think increased medical coverage and treatment would increase Kenya's performance in the sport of football?

Do you think better pitches and training/playing conditions would help prevent injury?