PREVALENCE AND PATTERNS OF INJURIES AMONG SWIMMERS AT SIR APOLLO KAGGWA SCHOOLS

BY
KWAGALA TEOPISTER
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NOVEMBER, 2018
DECLARATION

1. Kwagala Teopister, hereby declare that this dissertation titled “Prevalence and Patterns of Injuries among Swimmers at Sir. Apollo Kagwa Schools; Mengo and Nakasero sections” is my original effort and has never been before submitted to any Institution of higher learning for any academic award.

Signature.................................................. Date................................

Kwagala Teopister
APPROVAL

I certify that this dissertation titled “Prevalence and Patterns of Injuries among Swimmers at Sir. Apollo Kagwa Schools; Mengo and Nakasero sections” has been compiled under my supervision and is now ready for submission to the University Examinations Board.

Signature. __________________________ Date. ___/___/2018

Dr. Nankwanga Annet
DEDICATION

I dedicate this dissertation to my dear family; Mr. Wakabi Munaaba, Mrs. Mulaaza Betty, the family of Mr. & Mrs. Ssemakula.
ACKNOWLEDGEMENTS

In a special way, I wish to extend my sincere appreciation to the following people whose efforts towards the completion of this dissertation and academic career cannot go unrecognized;

First and foremost, I thank the Almighty God, who gave me strength and has enabled me to come this far, by guiding me throughout this period.

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May God reward you abundantly.
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ABSTRACT
The study sought to assess the prevalence and patterns of injuries among swimmers at Sir Apollo Kaggwa Schools. The following objectives guided the study: to find out the common swimming injuries sustained by the swimmers, to relate the type of injury sustained with the stroke of swimming carried out by swimmers and identify injury preventive measures put in place by the Sir Apollo Kaggwa Schools towards safe swimming as a sport. The study adopted a cross-sectional design in ascertaining the prevalence of swimming injuries among swimmers at Sir. Apollo Kaggwa schools. The researcher used the Purposive sampling as well as Convenience sampling when selecting the sampling units for the study. When using Purposive sampling, the researcher used prior knowledge to choose respondents who best represented the population of study. As for Convenience sampling, all those who were accessible and available on the day of data collection were included in the study. Data was collected using open and close ended questionnaires.

The results show that the commonest types of injuries affected swimmers is tendinopathy 33(28.0%). It was also revealed that the major the major form of injury associated with freestyle stroke of swimming is the tendinopathy, breast stroke swimming is dislocation, backstroke is the ligamentar rupture and for bufferfly stroke is sprain. It was also concluded that the most preventive measure towards injuries experienced during swimming is icing the injury.

It was recommended that swimmers need to learn better swimming strokes as a way of avoiding injuries that can stop their swimming career. It was recommended that Swimming Associations need to sensitize better swimming practices to swimmers in order to enhance them love their sports since it can be their future source of income. It was recommended that schools with swimming pools should provide students with good coaches in order to help them understand strategies of overcoming injuries affecting their profession.
CHAPTER ONE

1.0 Introduction
This chapter consists of the introduction to the study; it includes the background to the study, problem statement, research objectives, study significance, and the research questions.

1.1 Background to the study
Swimming is a water based sport which involves the use of the whole body during the exercise (Encyclopedia, 2014). According to Tan (2009), there are four swimming strokes; the front crawl commonly known as free style where technique involved is pretty simple, you float on your belly, back stroke which is kind of the free style except that the swimmer floats on their back in the water, breast stroke which involves a pattern where the body bobs upward and down, and butterfly which is a different technique and not advocated for beginning learners. Swimming is associated with numerous advantages that should motivate people and these include; the low impact is that there is no ground stress, its ability to build muscular mass, an alternative sport when injured, burns calories, can be continued for a life time since it is for all ages (Goldstein, 2011).

However regardless of all the advantages pointed out earlier, Kammer, Youc & Niedfelt (1999) established that swimming has a distinct profile of injuries and medical conditions that come along with it. Swimming places physical demands upon the body, including power; strength; endurance and co-ordination (Smith, 2014). Youc & Niedfelt identified that the most notable injuries to the swimmers’ shoulders are over use injuries that cause the inflammation of the supraspinatus, the biceps tendon injury, overuse injuries of the elbow, knee, ankle and the back; medical conditions range from asthma, folliculitis and atitisexterna, and the problems associated with over training. According to McMaster (1999) serious injuries among competitive swimmers are few compared to other sports especially those that involve contact and high energy circumstances. The incidence of a shoulder injury has been identified from a low level of 3% to a high level of 67% (Mutoch, 2012).

A 5-year survey from the National Collegiate Athletic Association (NCAA) revealed that overall elite swimmer injury rates were 4.00 injuries per 1000 hours training for men and 3.78 injuries per
1000 hours training for women. Shoulder injuries were the most common injuries with prevalence between 40% and 91%. The spine is also a recognized site predisposed to injury in the elite swimmer. Capacì et al reported that 33.3% of butterfly swimmers and 22.2% of breaststroke swimmers experienced low back pain. Mutoch (2012) found out that a 37% incidence of pain for butterfly swimmers, while Drori et al found a 50% incidence of pain for butterfly swimmers and 47% for breaststroke swimmers. Wolf et. al (2009) also asserted that the risk of injury in the collegiate swimming population ranges from 2.12 to 4.0 injuries per 1000 exposure. Wolf also observed that swimmers transitioning to a new level of swimming and potential longer distance demands in practice are at an increased risk for injury and with subsequent years of participation. The body part at risk seems to correlate with the activity the swimmer is performing.

Studies conducted by Lawler & Briton (2009) also established that approximately 60% of injuries occur while the swimmers are in the pool, while nearly 30 to 40% with cross training and weight lifting activities. The shoulder is the most frequently injured body part with in pool activities and the back or neck injured out of pool training, serious cervical spine and concussion injuries can occur with diving into the pool and with striking the head against the wall during back stroke events shoulder injury is common in non-breast stroke swimmers especially those who specialize in free style and butterfly which have repetitive overhead motions. The survey demonstrated a prevalence of up to 35% of the swimmers with current interfering shoulder pain, the shoulder symptoms and the related to impingement glen humeral instability (Wolf & Ebinger, 2009).

Since the early 2,000s, there has been an overall increase in swimming across Uganda with competitions held under the Federation of Swimming Association with oversight from the National Council of Sports and Ministry of Education and Sports. There has also been an increase in the number of athletes representing Uganda at International fetes such as the Olympics games, All-Africa games, Zonal Competitions among others which underlines Uganda’s resilience in transforming the sport into a competitive one (MoES, 2013).

The Sir Apollo Kagwa schools is an educational institution in Uganda renown not only for its exceptional academic performance but also tradition of sports and co-curricular activities which are exclusively carried out by the schools. Swimming is one activity that has often been promoted
among the schools and recently, the school acquired a fully fitted swimming pool that is meant to cater for the practice and competitions at the schools. However, young athletes have always been exposed to minor and devastating injuries which has in most cases affected their physique, mental preparation and performance levels which was evidently necessary in undertaking this study to establish the prevalence of injuries among swimmers at these schools.

1.2 Statement of the Problem
Swimming is a unique sport that combines upper and lower extremity strength exercises with cardiovascular training in a non-weight bearing environment. Four strokes are recognized in competitive swimming: freestyle, butterfly, backstroke, and breaststroke. Regardless of the stroke performed in competition, swimmers spend a considerable amount of their training time swimming freestyle. The highly repetitive motion that occurs in the normal swimming stroke can predispose elite swimmers to musculoskeletal injuries of the upper limb, knee, and spine.

Sir Apollo Kaggwa Schools have also often organized and engaged in inter-school events which has seen the growth and developmental of a sizeable number of young athletes even vying for prospects on the national team. However, the delight of having a swimming pool and professional instructors has also not come without significant challenges. Young athletes have always been exposed to minor and devastating injuries which has in most cases affected their physique, mental preparation and performance levels which was evidently necessary in undertaking this study to establish the prevalence and patterns of injuries at these schools.

1.3 Objectives of the study
1.3.1 General Objective
To assess the prevalence and patterns of injuries among swimmers in Sir Apollo Kagwa Schools.
1.3.2 Objectives of the study
1. To find out the number of swimmers who sustain injuries during swimming.
2. To find out the common swimming injuries sustained by the swimmers
3. To relate the type of injury sustained with the stroke of swimming carried out.
4. To identify injury preventive measures put in place by the Sir Apollo Kagwa Schools towards safe swimming as a sport.
1.4 **Research question**

1. What is the number of swimmers who sustain injuries during swimming?
2. What are the common swimming injuries sustained by the swimmers?
3. What is the relationship between the type of injury sustained and the stroke of swimming carried out?
4. What are the injury preventive measures put in place by the Sir Apollo Kagwa Schools towards safe swimming as a sport?

1.5 **Scope of Study**

The study was focused on assessing the prevalence and patterns of injuries among swimmers in Sir Apollo Kagwa Schools. The study was conducted in the Sir Apollo Kagwa Schools, Mengo and Nakasero Sections located in Kampala district among athletes and sports instructors. The study was conducted for a period of 6 months from April – August, 2017.

1.6 **Significance of the Study**

The study findings are to aid in widening the researcher’s knowledge about the common injuries in swimming as a sport. It is intended that this would aid the researcher to gain skills of conducting further research. The acquired skills are not limited to academic research but are of permanent importance to other researchers while carrying out research in different fields.

The study findings also serve as a source of literature for other scholars conducting similar surveys. The study findings will also provide background information to research organizations and scholars who may want to carry out further research in this area. The study findings are also meant to facilitate individual researchers to identify gaps in the current research and carry out research in those areas.

The study findings can also be adopted as a reference guide by instructors, swimming coaches and athletes to understand the common injuries suffered, their prevalence and how effective preventative mechanisms to curb these injuries geared towards safe swimming as a sport.
1.8 Definition of Key Terms

a) Sport – The United Nations (2003) broadly defines sports as all forms of physical activity that contribute to physical fitness, mental well-being and social interaction. These include play; recreation; organized, casual or competitive sport; and indigenous sports or games.

b) Injuries, these are damages that occur to the body and bring about pain in the affected area.

c) Swimmers, these are students who participate in regular and competitive swimming.
CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction
This chapter focuses on the review of the related literature in line with the study variables. The researcher mainly obtained the theoretical available written data by different authors on existing literature on patterns of swimming injuries in relation to the type of skill used by the swimmer. The literature has been obtained from books, dissertations, the internet, newspapers and journals. The chapter is presented basing on the study objectives as below;

2.1 Common swimming injuries
Swimming is a unique sport that combines upper and lower extremity strength exercises with cardiovascular training in a non-weight bearing environment. Four strokes are recognized in competitive swimming: freestyle, butterfly, backstroke, and breaststroke. Regardless of the stroke performed in competition, swimmers spend a considerable amount of their training time swimming freestyle. The highly repetitive motion that occurs in the normal swimming stroke can predispose elite swimmers to musculoskeletal injuries of the upper limb, knee, and spine. Even if swimming has the reputation of being low impact exercise, swimming injuries can nevertheless occur due to over demanding workouts or incorrect technique. Although the lack of impact in swimming makes it a perfect choice for avoiding lower body injuries, the intense involvement of upper body muscles makes overuse injuries a real possibility (Mrozek,1983). The common injuries in swimming are highlighted in the subsequent sub sections.

2.1.1 Shoulder injury
The most common swimming related injury are the swimmers shoulders injuries and shoulder pain usually caused by rotator cuff tendonitis (Pollard & Fernandes, 2004). The shoulder joint is a complex array of muscles, tendons, ligaments and bones all of which are designed to function in a specific manner at a specific time. The failure of any of these components to perform the designated action, for whatever reason, is it hereditary structural or muscular adaptation of the sport, jeopardizes the structural integrity of the whole system. The three common maladies of the swimmer’s shoulder include the multi-axial dysfunction syndrome, tendonitis and impingement syndromes. All the three problems are similar in their cause may encompass one or more of the
following. Repetitive errors in stroke mechanics, leading to joint structure injury; inadequacies in dry land exercise program, causing muscular imbalance; overuse of intrinsic structures due to training at competitive levels (Baraldi, 2006).

2.1.2 Knee injury

The breast stroke knee; the breast stroke knee or swimmers knee is an injury that can be generated by the stroke mechanics of the breast stroke kick (Jones, 2009). Basically when the legs extend, then they are bought back together during propulsive phase of the kick, the knee is subjected to external rotation, for which isn’t designed. In addition Slight (2013) says that the knees are commonly injured in breast stokers and this is normally brought about by medical collateral ligament strain, caused from excess torque on kick or can be due to a lack of lateral hip strength and weakness of the inner thigh muscles. The knee is another area that is frequently afflicted with one of the overuse syndromes known as swimmers knee. These conditions which are seen all too often in competitive swimmers, the knee has a joint component with a shallow socket, called the tibia plateau, which is ringed by cartilage to make the surface a deeper cup shape (Snyder, 2012). Because of the combination of several training factors, swimmers generally experience this type of medical knee pain as a unilateral entity (Blanch, 2004). The first of these is the fact a high percentage of competitive swimmers have tight hamstrings, which places an added stretch on the tendon as it crosses the joint. This muscle shortening is an adaptation of the muscle to the functional position required during propulsive kicking and turning.

2.1.3 Back injuries

Lower back injuries associated with lower back swimming injuries are also often due to incorrect technique while swimming free style; it can happen that you swim with a high head position and/or your hips and legs sink (Durnfold, 2014). As a sequence, the swimmer may be kicking hard to keep the legs up and be overarching the back. If this is the case, you should work on your position and balance so that you can find a relaxed horizontal position.

Back muscle pain or its aliases; pulled back muscle, back spasm, torn back muscle or back muscle strain, is very common among professional athletes (Jones, 2009). In fact, back muscle pain is the
most source of back pain. The good news is that is also one the quickest to heal and rehabilitate (Woolston, 2014).

2.1.4 Thigh injury
Literature reveals that there are a number of factors which can increase your risk of straining your thigh muscles. The most common include; muscle tightness, muscle fatigue, muscle imbalance, incorrect exercise technique, inadequate warm up period and also history of thigh strain/ tear without adequate rehabilitation (Smith et al 2006).

Groin pain is yet another injury commonly caused by a groin strain, groin hernia or other groin injury. A Groin strain is a muscular tear or rupture to anyone of your groin muscles; adductor brevis, longus Magnus, pectineus and gracilis, any of these groin muscles can be strained but the most common is adductor longus (Wolf, Ebinger & Brighton, 2009).

2.1.5 Neck injuries
Neck injuries, the neck is very mobile and this is why certain precautions must be taken to avoid swimming related injuries. Neck injuries are often due to incorrect technique (Jones, 2009).

2.2 Prevalence of Swimming Injuries
Ristolainen et al (2012) investigated the reasons behind athletes ending their career in sport. It was concluded that shoulder injury was the primary reason as to why swimmers careers were abruptly ended. Explanations behind this could be the repetitive motions of swimming and overuse of muscles resulting in the fatigue and failure of muscles to adhere to the correct stroke mechanics, enhancing the scope for injury (Mohesen et al, 2012). There are multiple preventative strategies which propose similar methods of preventing shoulder injuries which are vital in avoiding the long-term consequences of swimming injuries. Stretching the tight muscles of the chest including the pectoral muscles and strengthening the antagonistic muscles may be an appropriate intervention for correcting a positional or postural fault, such as forward shoulder posture caused by muscle imbalance (Klumper et al, 2006), and risk of shoulder injury may also be reduced if these techniques are adopted (Kendall et al, 1993 and Sahrmann, 2002). Additionally, Bak and Magnusson (1997) also suggest that the strength ratio of external to internal rotator muscles is seen
to be symptomatic of shoulder problems, and therefore specific shoulder stabilizing programmes which strengthen and balance out the differences of the internal to external rotators, may decrease the frequency of shoulder injuries within swimmers. However, McMaster and Troup (1993) identified in a survey of 1262 swimmers, factors interfering with shoulder pain in swimmers were weight training, use of hand paddles, kickboard use, stretching, and various resistance activities. This research contradicts other research which suggests stretching; carrying out latex band resistance exercises is shown to improve the muscle imbalance which takes place within the internal: external rotator muscles (Klumper et al, 2006).

Researchers agree that the prevalence of shoulder pain amongst swimmers is relatively high, with the findings of Tate et al (2012) stating that 18.6% of swimmers aged 12-14, 22.6% of high school swimmers and 19.4% of masters swimmers having issues associated with shoulder pain. In correspondence with this, Lynch et al (2009) reported that 78% of swimmers who participated in their clinical trial reported some level of shoulder pain. Both of the above researchers suggested that shoulder pain was associated with increased exposure to swimming, and Sein et al (2008) found that increased tendon thickness was correlated with supraspinatus tendinopathy (p<0.01) and 69% of the 52 participants had evidence of this ailment. It was also found that athletes participating at a higher level were more likely to see this problem occurring (rs=0.36, p<0.01) as there was a strong correlation between swimmers training 15+ hours a week and supraspinatus tendinopathy. However, Weldon and Richardson (2001) suggest that although greater exposure to swimming is an influencing factor of shoulder pain, other contributing factors such as flexibility, joint laxity, posture and muscle strength may play a role in ailments of the shoulder.

The findings of Harrington et al (2014) suggested that pectoral muscle length is a contributing factor towards shoulder pain and disability in female Division One swimmers. Of all the swimmers who participated in the study, only the ones who experienced shoulder pain were associated with a shorter pectoralis minor muscle length in both the resting and stretching position. In addition to this, the pectoral muscles have been shown to become shorter due to the anterior muscle imbalance which also protracts the shoulders (Kluemper et al, 2006). In connection to this, Solem-Bertoft et al (1993) implied that the protraction of the shoulder decreases sub-acromial space. In addition, other studies (Borstad and Ludewig, 2005) have also suggested that the shortening of the pectoralis
minor muscle is associated with improper scapular kinematics which results in a change in the resting position of the scapular, and a decrease in sub-acromial space. These researchers also reiterated that athletes with a shortened pectoralis minor are at a higher risk of shoulder impingement due to an increased exposure to elevation, force, and repetition. All of these studies reiterate and support the finding of Harrington et al (2014) as the shortening of the pectoral muscle leads to a protraction of the shoulders and a decrease in sub-acromial space, resulting in irritation of the shoulder and associated ailments.

The findings of Ramsi et al (2004) show in their study conducted over a 12 week swimming season, the strength of the internal rotator muscles increased continually throughout the 12 weeks. Whereas the strength of the external rotators increased in the first six weeks of the study, but not within the last six weeks of study, which leaves the shoulder vulnerable to potential issues during the second half of the swim season. The authors state that the swimmers taking part in other sporting activities may influence the strength of the external rotator muscles. This puts forward considerations to introduce other sporting activities to help develop or maintain the strength of the external rotators throughout the swim season. In association with the findings of Ramsi et al (2004), Miguel et Al (2012) found in their study of 120 participants, where 60 were swimmers and 60 were non-swimmers, within the swimming group, muscle imbalances of the internal rotators and external rotator muscles were present. Significant differences were found between groups for the values of the internal rotator and internal/external rotator ratio. Both Warner et al (1990) and Leroux et al (1994) endorse these results in relation to shoulder injuries, as they reiterate that a decrease in the concentric strength of the external rotators, along with an increase in the strength of the internal rotators such as the finding presented in the study of Miguel et al (2012) are characteristics leading to instability of the glenohumeral joint resulting in the increase in risk of an injury of this joint.

Reimann et al (2011) examined the range of motion of the glenohumeral joint in competitive swimmers. The findings suggested the range of motion in the dominant vs non-dominant shoulder was that the non-dominant shoulder had a greater internal rotation range of motion in comparison to the dominant shoulder. The dominant shoulder had a greater external rotation range of motion. However, demographic factors need to be taken into consideration such as age, gender, other
sporting activities and work life. This is due to the 144 participants who took place in the study ranging from 12-61 years of age, and this age range within the study needs to be considered, because although the results are specific within age categories, the study was not focused on one age group, which may have been more beneficial due to the most shoulder injuries occurring in swimming during high school and early adult hood years (Tate et al., 2012).

It was established in the findings of McKenna et al (2011) in a study of 46 junior elite and 43 physically active non-swimmers that the position of the scapular was more symmetrical than that of the non-swimmers, this could be due to the bilateral actions of all swimming strokes which develops the symmetry of the scapular. The finding of this study concluded no differences in scapula and humeral head position between the two groups P=0.438 for the superior kibler and P=0.439 for the inferior kibler. However, as this study tested the participants when the individuals were not fatigued it may have had an impact on the significance of the results. Had the swimmers been fatigued prior to the measurements been taken, the posture of the swimmer may have been different leading to a difference in the results which were measured. The significance of this study may have been affected, the validity of this study was increased due to the large number of participants involved in comparison to other studies involving swimmers. If there was a abnormal result within the data, it would have had less of an impact on the rest of the results, this makes the results more reliability had there been a retest of this study.

Abgarov et al (2012) exposed in their study of 170 varsity-level swimmers, that a higher proportion of swimmers obtained shoulder injuries during the swimming season rather than prior to it, which highlights that increased swim volume within the swim season is a key factor relating to shoulder injuries with other studies (Mcmaster and Troup, 1993) supporting these findings. Additionally, it was found that swimmers who take time off from training due to injury place unrealistic demands on themselves on return to training as they try to return to their previous fitness state, this results in a higher chance of a recurring injury as (Driska et al, 2012) informs us that elite swimmers push themselves more intensely than other swimmers possibly resulting in injury. Expanding on the return rates to the sport, Brushøj et al (2007) discovered that after surgery, in a study of 18 swimmers who all had surgery on their shoulder, only 56% of them returned to the sport postsurgery, this implies the success and rate of return after surgery to the sport is low in
association with swimming; this suggests that for competitive athletes, alternative methods would be more beneficially adhered to as mentioned within the general findings of the preventative strategies.

The study by Mohsen et al (2012) emphasized swimmers shoulder (common terminology used for multiple shoulder ailments in swimmers), is a result of poor technique. This article was graded IV, therefore leaving it slightly less significant to some other articles reviewed, and the article also does not support nor it is supported by any other articles used within this review. This could be due to the nationality of the participants included within the study (Iranian) possibly suggesting that middle-eastern countries have different factors which affect the prevalence of shoulder injuries due to possible lifestyle aspects or coaching techniques.

2.3 Prevention of swimming injuries

According to various studies conducted on preventative measures to swimming injuries, learning a proper technique goes a long way toward preventing injuries. If you’re standing out, schedule some sessions with a swimming coach, remember to warm-up and stretch before every swim, giving particular attention to your shoulders (Raskin, 2006).

Survey conducted by the National Collegiate Athletic Association (NCAA) established that strength training program coupled with intense upper body gym workouts can help build up the muscles on shoulders and the upper back to help athletes avoid shoulder injuries. Raskin (2006) also adds that however, the workouts should be conducted with the supervision and guidance of a professional personnel such as a physiotherapist, sports scientist or trainer to avoid wrong workouts which might aggravate injuries during the workouts or the swimming sessions.

Studies conducted by Martini (2014) established that in many cases, swimmers’ shoulder can be successfully treated using physical therapy. The study found out that the routine was highly responsive for competitive athletes and in relentless rotor cuff surgery maybe recommended if shoulder pain persisted after 6months of guided rest and rehabilitation. Martini’s findings are also supported by Mpaabe (2010) who established that physical therapy for professional athletes was
responsive to eliminating shoulder pain and a healthier and cheaper alternative compared to medical treatment of surgery.

According to Jones, (2009) he suggests that to avoid injuries like breast stroke knee, it’s advisable to alternate swimming strokes, have resting periods during the year where swimmers don’t swim breaststroke and do strengthening exercise for the hamstrings and quadriceps. It’s also good for swimmers to know leg exercises they can do to strengthen their legs. While swimming the freestyle stroke, the swimmer should keep the head in line with the spine and the eyes should look straight down. Swimmers also ought to avoid looking to the front or lifting the head to breathe. Additionally, Baechle (2012) suggests that swimmers should avoid over rotating the head during the inhale (only rotate the body more so that the head doesn’t need to rotate so much to clear the water) to avoid breast stroke knee injuries. Knopf (2012) also suggests that while swimming the breaststroke or butterfly stroke, swimmers should keep the head aligned with the spine at all times when they breath in, look rather down than the front so that the head stays in a neutral position and the breast stroke and swim distances must be increased gradually so that the anterior neck muscles have time to adopt whereas while swimming butterfly, there’s need for swimmers to work on body undulation and dolphin kick so that it’s the body wave that lifts your upper body out the water and not your back.

Studies conducted by Zanconate (2006) suggest that other strategies that can be done to reduce the injury rate include placing emphasis on well planned dry land sessions, being careful with ply metric exercises, swimmers ought not to deal with compressive forces as other athletes, box jumps are extremely advised, stroke variety in practice, good warm-ups emphasizing large muscle groups and shoulder stretches following every practice (Zanconate, 2006). It’s also necessary to keep practices fun, fewer injuries occur when athletes have a good time, proper nutrition to repair and rebuild muscles (Westcott, 2007). If multiple athletes are getting injured, it’s usually the workout, it is therefore necessary to go for early evaluation and treatment.

Mrozek (2008) suggests that in order to reduce the swimming injury risks, swim coaches and professional trainers must necessarily take on a number of responsibilities essentially ensuring that the swimmers are performing the strokes correctly and also have the adequate training to perform
at their best. Various studies conducted also affirm that the swimming injuries are most prevalent among athletes who do not have the adequate or correct training from professional trainer which is one of the reasons for the high rates of swimming injuries in the 1990s (Mpaabe, 2010; Mukoone, 2016; Westcott, 2007).

Back pain is one of the commonest health complaints suffered by swimmers and often results from incorrect workout or stroke during practice or training. Various studies suggest a range of alternative options to curb back pain among swimmers with physiotherapy, physical therapy (Martini, 2014), Slaught, (2013) also suggests that physiotherapy treatment for simple back pain can be effective in hastening muscle and ligament healing.
CHAPTER THREE
METHODOLOGY

3.0 Introduction
This chapter presents the research design; study population; sampling procedures; research methods; research procedure; data collection methods that were used in conducting the study as well as the limitations to the study and how they were overcome.

3.1 Research Design
The study adopted a cross-sectional design in ascertaining the prevalence of injuries among pupils who swim at Sir. Apollo Kagwa schools.

3.2 Area of Study
The study was carried out in Sir. Apollo Kagwa Schools among the sections of Nakasero and Mengo. These schools are located in Central Division and Rubaga Division of Kampala districts. The choice of selection for these schools stemmed from the high levels of engagement of these schools in Junior Swimming competitions both at the Zonal and national levels. Sir Apollo Schools have also often organized and engaged in inter-school events which has seen the growth and developmental of a sizeable number of young athletes even vying for prospects on the national team though the swimmers have often suffered adverse injuries and recently, four of the school’s best swimmers missed slots at the Juniors’ nationals due to injury.

3.3 Target population
The study only targeted pupils of the two schools as well as coaches or trainers managing swimming activities at these schools.

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria
The study only included pupils or junior swimmers who had been involved in active swimming for at least the last 3 months (term of academic study) as well as trainers who had been actively engaged in coaching and managing swimmers for at least the last 3 months (term of academic study). Three months were chosen for the study because this is a period that confines school terms of primary school studying period.
3.4.1 Exclusion Criteria
The study excluded pupils or junior swimmers who had not been involved in active swimming for at least the last 3 months (term of academic study) as well as trainers who had not been actively engaged in coaching and managing swimmers for at least the last 3 months (term of academic study) and those who did not consent to participate in the study.

3.5 Sampling techniques and Sample Size

3.5.1 Sampling techniques
The researcher used the Purposive sampling as well as Convenience sampling when selecting the sampling units for the study. When using Purposive sampling, the researcher used prior knowledge to choose respondents who best represented the population of study. As for Convenience sampling, all those who were accessible and available on the day of data collection were included in the study.

3.5.2 Sample Size
The researcher then selected an adequate sample for the study using the techniques listed above. This sample size was determined according to the sample determination table developed by Krejcie and Morgan (1970) as shown in the table 1.

Table 3.1: Targeted sample size

<table>
<thead>
<tr>
<th>Respondent category</th>
<th>Parent Population</th>
<th>Sample Size</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Junior Swimmers</td>
<td>240</td>
<td>117</td>
<td>Krejcie and Morgan</td>
</tr>
<tr>
<td>Trainers</td>
<td>5</td>
<td>3</td>
<td>Krejcie and Morgan</td>
</tr>
<tr>
<td>Total</td>
<td>245</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

Source: Study data

3.6 Sources of Data
The sources of data that were used by the researcher to collect data included the primary and secondary sources of data.
3.5.1 Primary Data
This was data collected by the researcher from the field for the first time. It was developed specifically for the case study. The data was collected from responses of the questionnaires that were distributed as well as the interviews conducted. This source of data was used because it is cheap and easier to collect data from a large population, within the shortest time that would be available for the study.

3.5.2 Secondary Data
This included all data collected from already published sources. This data was collected from documentary references such as monthly reports, minutes, journals, published books, newspapers and internet. This source of data was meant for supplementary purposes to the primary data source in order to get adequate data and relate the study findings with the findings from published studies.

3.6 Data Collection Tools and Methods

3.6.1 Questionnaires
Questionnaires were the main research instrument used in this study. They were designed according to the research objectives and were given to the respondents to answer them. The questionnaires had both open-ended and close-ended questions. The researcher extensively used the questionnaires because they are relatively easier to use and could be filled in by the respondents at their ample time. These questionnaires were administered to the respondents that had been identified by the researcher.

3.6.2 Focused Group Discussions
Focused Group discussions were also conducted with sections of the respondents to ascertain collective arguments on injuries resulting from nature of stroke used. The FGDs consisted of 8 respondents who were interviewed by the researcher. The essence of conducting these discussions was to add on the existing information available.

3.7 Data Collection Procedure
A letter of introduction was obtained from the Department of Biochemistry and Sports Sciences. The letter was then presented to the Director in Charge of Pupils’ affairs at the Sir. Apollo Kagwa Main Campus in Mengo requesting for permission to undertake the study in the Nakasero and
Mengo schools. The researcher was then introduced to the Swimming coordinator who worked hand in hand with the researcher to conduct the study. The researcher then presented herself to the respondents, explained to them the purpose and objectives of the study. She then distributed out the questionnaires to the respondents and were filled in. The focused group discussions were also held on dates set with the coordinator and involved the researcher interacting with groups of between 5-8 swimmers. Confidentiality was reassured to the respondents and the researcher also consented them to participate in the study before distributing the questionnaires for the data collection process.

3.8 Data management
After the questionnaires had been filled, the researcher looked through each of them to ensure that they were complete. She then appropriately coded the responses before entering them into SPSS software for the data analysis.

3.9 Data Processing, presentation and Analysis.
Data was analyzed in the following ways;
Content analysis was used in analyzing the qualitative data. The researcher checked the accuracy of the data collected by editing and coding it. The data was then summarized by counting various aspects of the data.

Quantitative data was coded at first, entered and was analyzed using Statistical Package for Social Sciences (SPSS) program. This helped the researcher to generate descriptive statistics that have been presented in form of frequencies, percentages and explanatory tables presenting the findings so that the work maybe simplified for others to refer to.

3.10 Limitations of the Study and way forward
Inadequate funds to conduct the survey given the complex nature of the study as well as the need for funds to handle the different study activities such as producing the questionnaires, printing among other study costs presented major challenges for the researcher. However, the researcher developed a workable budget which she presented to her sponsors to help with meeting part of the study costs.
Some respondents were not cooperative. The researcher had to adequately explain the relevance of this study to the respondents and how they stood to gain.

Some respondents lacked time for the interviews so the researcher had to first set appointments with the swimming coordinator so that the interviews would be adequately scheduled. The researcher also consented with the trainers to set appropriate appointment dates with their personnel for effective data collection.

3.11 Ethical Considerations
Permission to conduct the research was granted by the Department of Sports Science Studies at Makerere University and while conducting research, care was taken to respect human dignity and secure information. The information acquired has been kept confidential and used for the dissertation purposes only. Another ethical issue adhered to has been integrity which has involved acknowledging sources as well as respect for the data. Owing to the fact that most of the junior swimmers are minors (of age less than 18years), the researcher sought permission from the teachers before obtaining information from the swimmers.
CHAPTER FOUR
DATA ANALYSIS, PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Introduction
This chapter provides the presentation and interpretation of the findings the researcher obtained from the field in relation to her research objectives and questions. It is upon this analysis that the researcher used to make the recommendations and conclusions.

4.1 Bio-data Characteristics of the respondents
4.1.1 Sex of the Respondents
As indicated in Table 4.1, the findings of the study established that out of the 120 respondents, 55% of the respondents were female while 45% were male. This indicates that there more girls engaging in swimming at the Sir. Apollo Kagwa schools compared to their male counterparts. The explanation for these results stems from the fact that the boys have passion for other sports such as football and athletics.

Table 4.1: Sex of the Respondents

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>54</td>
<td>45.0</td>
</tr>
<tr>
<td>Female</td>
<td>66</td>
<td>55.0</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

4.1.2 Age of the Respondents
From the study, out of the 120 respondents, it was established that 36.7% of the respondents were between the ages of 9 – 10 years, this was followed by 28.3% of the respondents who were less than 5 years, 20% of the respondents were above 11 years while 15% of the respondents were between the ages of 6-8 years. This indicates that there’s a relatively even distribution of swimmers regardless of age and class of attendance as indicated in Table 4.2.
Table 4.2: Age of the Respondents

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>34</td>
<td>28.3</td>
</tr>
<tr>
<td>6 - 8</td>
<td>18</td>
<td>15.0</td>
</tr>
<tr>
<td>9 – 10</td>
<td>44</td>
<td>36.7</td>
</tr>
<tr>
<td>above 11</td>
<td>24</td>
<td>20.0</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

4.2 Swimming Proficiency

This section sought to establish the swimming proficiency of the swimmers at the Sir. Apollo Kagwa schools. The relevance of this section stems from the fact that swimmers that exhibit high levels of proficiency are better adaptable and suffer less from injuries compared to those that are less proficient. The variables targeted under this section included; the duration of swimming in years, favorite swimming positions, distance swum, warm-up and exercise activities before training sessions.

4.2.1 Duration the Swimmers have been Engaged in Active Swimming

The study sought to establish how long the swimmers had been engaged in active swimming. From the study findings as indicated in Table 4.3, it was established that 41.7% of the respondents had been involved in active swimming for between 1-2 years, 26.7% of the respondents had spent between 3-4 years, 23.3% had taken less than 1 year in active swimming while 8.3% had spent above 5 years in active swimming. The findings indicate that a sizeable number of the swimmers were intermediate swimmers.

Table 4.3: Duration the swimmers have been engaged in active swimming

<table>
<thead>
<tr>
<th>Years engaged in active swimming</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>28</td>
<td>23.3</td>
</tr>
<tr>
<td>1 - 2</td>
<td>50</td>
<td>41.7</td>
</tr>
<tr>
<td>3 - 4</td>
<td>32</td>
<td>26.7</td>
</tr>
<tr>
<td>above 5</td>
<td>10</td>
<td>8.3</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data
4.2.2 Favorite swimming stroke

The respondents were asked of their favorite swimming strokes. From the study findings as indicated in Table 4.4, it was established that 45.0% of the respondents were most interested in the freestyle followed by 30.0% of the respondents who preferred the breaststroke, 15% of the respondents preferred backstroke and the butterfly stroke was least preferred accounting for 10.0%.

Table 4.4: favorite swimming stroke

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freestyle</td>
<td>54</td>
<td>45.0</td>
</tr>
<tr>
<td>Breaststroke</td>
<td>36</td>
<td>30.0</td>
</tr>
<tr>
<td>Backstroke</td>
<td>18</td>
<td>15.0</td>
</tr>
<tr>
<td>Butterfly</td>
<td>12</td>
<td>10.0</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

4.2.3 How many metres are often swum by the athletes?

The study findings indicated majority of the respondents 58(48.3%) swum oftenly swim 50m. Respondents who swim 100m followed with a representation of 30(25.0%). Respondents who swim <25m followed with a representation of 22(28.3%). Those who swim 200m were only 6(5.0%). While those who swim above 200m were only 4(3.3%).

Table 4.5: How many metres are often swum by the athletes?

<table>
<thead>
<tr>
<th>Distance in metres (m)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>22</td>
<td>28.3</td>
</tr>
<tr>
<td>50m</td>
<td>58</td>
<td>48.3</td>
</tr>
<tr>
<td>100m</td>
<td>30</td>
<td>25.0</td>
</tr>
<tr>
<td>200m</td>
<td>6</td>
<td>5.0</td>
</tr>
<tr>
<td>above 200m</td>
<td>4</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data
4.2.4 Do swimmers warm-up before training?
As indicated in Table 4.6, majority of the respondents 84(70.0%) agreed that swimmers warm up before training. Least of the respondents 36(30.0%) disagreed when they were asked whether swimmers warm up before training.

Table 4.6: Do swimmers warm-up before training?

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>84</td>
<td>70.0</td>
</tr>
<tr>
<td>No</td>
<td>36</td>
<td>30.0</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

4.2.5 Do swimmers undertake strength exercises as part of their training?
As indicated in Table 4.7, the findings of the study established that out of the 120 respondents, 65.8% agreed that swimmers undertake strength exercises as part of their training. On the other hand, 34.2% disagreed when they were asked whether swimmers undertake strength exercises as part of their training.

Table 4.7: Do swimmers undertake strength exercises as part of their training?

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>79</td>
<td>65.8</td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>34.2</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

4.2.6 Do swimmers undertake any other physical activities apart from swimming?
As indicated in Table 4.8, the findings of the study established that out of the 120 respondents, 55% undertake other physical activities apart from swimming. 45% disagreed when they were asked whether swimmers undertake any other physical activities apart from swimming.

Table 4.8: Do swimmers undertake any other physical activities apart from swimming?

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>66</td>
<td>55.0</td>
</tr>
<tr>
<td>No</td>
<td>54</td>
<td>45.0</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data
4.3 Percentage of Injuries sustained by Swimmers of Sir Apollo Kaggwa Schools

4.3.1 Do swimmers often feel pain during or after swimming?

As shown in Table 4.9, the findings of the study established that out of the 120 respondents, 104(87.0%) agreed that swimmers oftenly feel pain during or after swimming. Respondents who disagreed had a representation of 12(10.0%). Least of the respondents 4(3.0%) were not sure with the question. This implies that most of the swimmers of Sir. Apollo Kaggwa schools oftenly feel pain during or after swimming.

Table 4.9: Do swimmers often get injuries during or after swimming?

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>104</td>
<td>87</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Not Sure</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data

4.3.2 When do you often get injuries?

As indicated in Table 4.10, the findings of the study established that out of the 120 respondents, majority of them 44(36.7%) said that they often get injured 3 – 4 times. Respondents who said <5 times followed with a representation of 34(28.3%). Least of the respondents said 1 – 2 times 18(15.0%). Results imply that most of the swimmers of Sir Apollo Kaggwa schools oftenly get injured 3 – 4 times.

Table 4.10: When do you often get injuries?

<table>
<thead>
<tr>
<th>Number of times of getting injuries</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>34</td>
<td>28.3</td>
</tr>
<tr>
<td>1 - 2</td>
<td>18</td>
<td>15.0</td>
</tr>
<tr>
<td>3 - 4</td>
<td>44</td>
<td>36.7</td>
</tr>
<tr>
<td>above 11</td>
<td>24</td>
<td>20.0</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data
4.3.3 Do you suffer any injuries in the previous three months?
Results according to Figure 4.1 revealed that majority of the respondents 98(82.0%) agreed that they had suffered injuries in the previous three months. Least of the respondents 22(18.0%) disagreed when they were asked whether they had suffered injuries of the previous three months. Results therefore indicate that there is a high prevalence of injuries among swimmers in Sir Apollo Kaggwa Schools.

Figure 4.1: Do you suffer any injuries in the previous three months?

Source: Primary Data
4.3.4 When did you experience these injuries?

Results in Table 4.11 revealed that majority of the respondents 49(41.0%) said that they experience injuries after competition and training. Respondents who said during competition followed with a representation of 27(23.0%). Least of the respondents did not report 11(9.0%). Results imply that most of the swimmers in Sir Apollo Kaggwa schools experience injuries after the completion / training.

Table 4.11: When did you experience these injuries?

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>During Training/ Practice</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>During Competition</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>After competition / training</td>
<td>49</td>
<td>41</td>
</tr>
<tr>
<td>Only during warm up</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>Not reported</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Primary Data*
4.3.5 Which part of your body got injured?

Results in Table 4.12 revealed that majority of the respondents 23(19.0%) said that the major part of the body which is mostly injured is shoulder. Respondents who said knee followed with a representation of 18(15.0%). Respondents who said ankle followed with a representation of 13(11.0%). Least of the respondents 6(5.0%) said leg. Results therefore imply that the most common body part which is affected by injuries among swimmers of Sir Apollo Kaggwa schools is the shoulder.

Table 4.12: Which part of your body got injured?

<table>
<thead>
<tr>
<th>Body part injured</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Shoulder</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>Elbow</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Hip / thigh</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Knee</td>
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<td>15</td>
</tr>
<tr>
<td>Leg</td>
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<td>5</td>
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<td>Chest</td>
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<td>7</td>
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<tr>
<td>Knee</td>
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<td>Back lower part</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.0</strong></td>
</tr>
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</table>

*Source: Primary Data*
4.3.6 What are the commonest types of injuries suffered by the swimmers?

Results in Table 4.13 revealed that, majority of the respondents said that the commonest types of injuries that affected swimmers is tendinopathy 33(28.0%). Respondents who said ligament rapture followed with a representation of 27(23.0%). Respondents who said dislocation followed with a representation of 21(18.0%). Least of the respondents 7(6.0%) said meniscal / cartilage. Results imply that the common form of injuries sustained by swimmer of Sir Apollo Kaggwa schools is tendinopathy.

Table 4.13: What are the commonest types of injuries suffered by the swimmers?

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<thead>
<tr>
<th>Body part</th>
<th>Frequency</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Tendinopathy</td>
<td>33</td>
<td>28</td>
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<tr>
<td>Dislocation</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Sprain</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Arthritis/ Synovitis/ Bursitis</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Ligamentar rupture</td>
<td>27</td>
<td>23</td>
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<tr>
<td>Meniscal/ Cartilage</td>
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<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.0</strong></td>
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</tbody>
</table>

*Source: Primary Data*
4.4 Relating the Types of Injuries Sustained with the Strokes of Swimming

4.4.1 Do you think all swimming strokes have injuries associated with them?

Results in Figure 4.3 revealed that majority of the respondents111(92.0%) agreed that all swimming strokes have injuries associated with them. 9(8.0%) disagreed that not all swimming strokes have injuries associated with them. Results therefore imply that swimmers in Sir Apollo Kaggwa schools experience

Figure 4.3: Do you think all swimming strokes have injuries associated with them?

Source: Primary Data
4.4.1 What are the types of injuries associated with the swimming strokes?

Results in Table 4.14 revealed that 33(28.0%) of the respondents said that the major form of injury associated with freestyle stroke of swimming is the tendinopathy 33(28.0%). Some of the other respondents 29(24.0%) said that the major form of injury associated with the breast stroke swimming is the dislocation 29(24.0%). Majority of the respondents also said that the major form of injury associated with the backstroke is the ligamentar rupture with a representation of 39(33.0%). Many of the respondents also said that the major form of injury associated with the butterflly stroke of swimming is the sprain 31(26.0%).

Table 4.14: What are the types of injuries associated with the swimming strokes?

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<thead>
<tr>
<th>Types of injuries</th>
<th>Frequency (N=120)</th>
<th>Percent (100%)</th>
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<td>Dislocation</td>
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<td>18</td>
</tr>
<tr>
<td>Sprain</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Arthritis/ Synovitis/ Bursitis</td>
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<td>Ligamentar rupture</td>
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<td>23</td>
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<td>Meniscal/ Cartilage</td>
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<td>6</td>
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<td><strong>Backstroke</strong></td>
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<tr>
<td>Meniscal/ Cartilage</td>
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<td>5</td>
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<tr>
<td><strong>Butterfly</strong></td>
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<td></td>
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<tr>
<td>Tendinopathy</td>
<td>21</td>
<td>18</td>
</tr>
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<td>11</td>
</tr>
<tr>
<td>Sprain</td>
<td>31</td>
<td>26</td>
</tr>
<tr>
<td>Arthritis/ Synovitis/ Bursitis</td>
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<td>14</td>
</tr>
<tr>
<td>Ligamentar rupture</td>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>Meniscal/ Cartilage</td>
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<td>11</td>
</tr>
</tbody>
</table>

Source: Primary Data
4.5 The Injury Preventive Measures put in place towards safe swimming as a Sports

4.5.1 Do you think injuries experienced by swimmers can be prevented?

It was revealed by the results of this study that majority of the respondents 109(92.0%) said that injuries experienced by swimmers can be prevented. Least of the respondents 11(9.0%) disagreed when they were asked whether injuries experienced by swimmers can be dealt with. Results therefore imply that most swimmers in Sir Apollo Kaggwa schools understand that injuries experienced by them during swimming and competition can be dealt with.

Figure 4.4: Do you think injuries experienced by swimmers can be prevented?

Source: Primary Data
4.5.3 **What are the preventive measures towards injuries experienced by swimmers?**

Results in Table 4.15 revealed that majority of the respondents 31(26.0%) of the respondents said that the major preventive measures towards the injuries experienced is icing the injury. Respondents who said warming up followed with a representation of 25(21.0%). Respondents who said relaxing from swimming followed with a representation of 21(18.0%). Least of the respondents 13(11.0%) said physical practices done by the injured people. Results therefore imply that most of the swimmers in Sir Apollo Kaggwa schools agreed that icing the injured parts is the most suitable measure towards dealing with the injuries experienced during swimming.

**Table 4.15: What are the preventive measures towards injuries experienced by swimmers?**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relax from swimming</td>
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<td>20</td>
</tr>
<tr>
<td>Icing the injury</td>
<td>41</td>
<td>34</td>
</tr>
<tr>
<td>Fixing the rupture</td>
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<td>14</td>
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<tr>
<td>Warm up</td>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>Physical practices</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*Source: Primary Data*
CHAPTER FIVE
DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

5.1 Discussion of the Findings

5.1.1 Percentage of Injuries sustained by Swimmers of Sir Apollo Kaggwa Schools
Results of this study revealed that majority of the respondents, 104(87.0%) agreed that swimmers often feel pain during or after swimming. Many respondents 44(36.7%) said that they often get injured 3 – 4 times, Majority of the respondents 98(82.0%) also agreed that they had suffered injuries in the previous three months. Majority of the respondents 49(41.0%) said that they experience injuries after competition and training. Many respondents 23(19.0%) said that the major part of the body which is mostly injured is shoulder and that majority of the respondents said that the commonest types of injuries affected swimmers is tendinopathy 33(28.0%). Findings of this study are in agreement with Pollard & Fernandes, (2004) who also found out that the most common swimming related injury are the swimmers shoulders injuries and shoulder pain usually caused by rotator cuff tendonitis (Pollard & Fernandes, 2004). The shoulder joint is a complex array of muscles, tendons, ligaments and bones all of which are designed to function in a specific manner at a specific time. The failure of any of these components to perform the designated action, for whatever reason, is it hereditary structural or muscular adaptation of the sport, jeopardizes the structural integrity of the whole system. The three common maladies of the swimmer’s shoulder include the multi-axial dysfunction syndrome, tendonitis and impingement syndromes.

5.1.2 Relating the Types of Injuries Sustained with the Strokes of Swimming
Results of this study revealed majority of the respondents111(92.0%) agreed that all swimming strokes have injuries associated with them. Results of this study also revealed that 33(28.0%) of the respondents said that the major form of injury associated with freestyle stroke of swimming is the tendinopathy 33(28.0%). While some respondents 29(24.0%) said that the major form of injury associated with the breast stroke swimming is the dislocation 29(24.0%). Majority of the respondents also said that the major form of injury associated with the backstroke is the ligamentar
rupture with a representation of 39(33.0%). Majority of the respondents also said that the major form of injury associated with the butterfly stroke of swimming is the sprain 31(26.0%).

Findings of this study are in agreement with Ristolainen et al (2012) who investigated the reasons behind athletes ending their career in sport. His findings concluded that shoulder injury was the primary reason as to why swimmers careers were abruptly ended. Explanations behind this could be the repetitive motions of swimming and overuse of muscles resulting in the fatigue and failure of muscles to adhere to the correct stroke mechanics, enhancing the scope for injury (Mohesen et al, 2012).

5.1.3 The Injury Preventive Measures put in place towards safe swimming as a Sports

Results of this study found out that majority of the respondents 109(92.0%) said that injuries experienced by swimmers can be prevented. Results also revealed that majority of the respondents 31(26.0%) of the respondents said that the major preventive measures towards the injuries experienced is icing the injury.

Findings of this study are in agreement with Raskin, (2006) who conducted a study and observed that there are preventative measures to swimming injuries, learning a proper technique goes a long way toward preventing injuries.

In support of the above, Jones, (2009) also suggests that to avoid injuries like breast stroke knee, it’s advisable to alternate swimming strokes, have resting periods during the year where swimmers don’t swim breaststroke and do strengthening exercise for the hamstrings and quadriceps. It’s also good for swimmers to know leg exercises they can do to strengthen their legs.
5.2 Conclusions

5.2.1 Percentage of Injuries sustained by Swimmers of Sir Apollo Kaggwa Schools
Findings showed that there was a high prevalence of injuries among swimmers of Sir Apollo Kaggwa Schools. This was in the approval of the findings which concluded that swimmers oftenly feel pain during or after swimming 104(87.0%). The commonest types of injuries observed among swimmers is tendinopathy 33(28.0%). It was also concluded basing on the findings that the most common part of the body injured during swimming is the shoulder 23(19.0%).

5.2.2 Relating the Types of Injuries Sustained with the Strokes of Swimming
It was concluded that the major form of injury associated with freestyle stroke of swimming is the tendinopathy 33(28.0%), the major form of injury associated with the breast stroke swimming is the dislocation 29(24.0%), the major form of injury associated with the backstroke is the ligamentar rupture with a representation of 39(33.0%) and that the major form of injury associated with the bufferfly stroke of swimming is the sprain 31(26.0%).

5.2.3 The Injury Preventive Measures put in place towards safe swimming as a Sports
It was also concluded that the most preventive measure towards injuries experienced during swimming is icing the injury 31(26.0%) Results of this study found out that majority of the respondents 109(92.0%) said that injuries experienced by swimmers can be prevent.
5.3  Recommendations

It was recommended that swimmers need to learn better swimming strokes as a way of avoiding injuries that can stop their swimming career.

It was recommended that swimming association need to sensitize better swimming practices to swimmers in order to enhance them continue with swimming sports since it can be their future source of income.

It was recommended that schools with swimming pools should provide students with good coaches in order to help them understand strategies of overcoming injuries affecting their profession.

It was recommended that the ministry of education and sports should include swimming in their teaching curriculum in order to make students award of the strokes involved hence motivating them into their swimming career.
REFERENCES


Appendix I

Questionnaire for Swimmers

Dear Respondent;

My names are Kwagala Teopister a student of Makerere University, College of Natural Sciences finalizing my Degree of Bachelor of Sports Science. As part of my academic requirements, I am undertaking a research study on “Prevalence of swimming injuries among swimmers in Sir. Apollo Kagwa Schools”. You have been selected as a respondent to fill some questions for the study. This questionnaire is purely for academic purposes and you are kindly requested to spare some time on your schedule and answer the questions correctly. All your views will be kept with utmost confidentiality.

Section A: Background Information

1. What is your gender?
   a) Male ☐
   b) Female ☐

2. How old are you? (years)
   a) <5 ☐
   b) 6 – 8 ☐
   c) 9 – 10 ☐
   d) above 11 ☐

Section B: Swimming Proficiency

3. For how long have you been engaged in active swimming? (years)
   a) <1 ☐
   b) 1 - 2 ☐
   c) 3 - 4 ☐
   d) >11 ☐

4. What is your favorite swimming stroke?
   a) Freestyle ☐
   b) Backstroke ☐
   c) Breaststroke ☐
   d) Butterfly ☐

5. How many metres do you often swim?
   a) <25m ☐
   b) 50m ☐
   c) 100m ☐
   d) 200m ☐
   e) above 200m

6. Do you first warm-up before training?
   a) Yes ☐
   b) No ☐
7. Do you undertake strength exercises as part of your training?
   b) Yes □   b) No □

8. Do you undertake any other physical activities apart from swimming?
   a) Yes □   b) No □

Section C: Occurrence and description of pain as reported by swimmers

9. Do you often feel pain during swimming or after swimming?
   a) Yes □   b) No □   c) Sometimes

10. When do you often feel the pain?
    a) Training □   b) Competition □

11. How do you feel the pain?
    a) Continuous □
    b) After competition/ Training □
    c) Only during warmup □
    d) Not reported □

12. Which part of your body often experiences the pain?
    a) Neck □
    b) Shoulder □
    c) Elbow/ Wrist/ Hand/ Finger □
    d) Hip/ Thigh □
    e) Knee □
    f) Leg □
    g) Chest □
    h) Knee □
Section D: Occurrence and description of previous injuries in last three months

13. Do you suffer any injuries in the previous three months?
   a) Yes □       b) No □

14. When did you experience these injuries?
   a) Training/ Practice □       b) Competition □

15. Which part of your body got injured?
   a) Neck □
   b) Shoulder □
   c) Elbow/ Wrist/ Hand/ Finger □
   d) Hip/ Thigh □
   e) Knee □
   f) Leg □
   g) Chest □
   h) Knee □
   i) Ankle/ Foot □
   j) Back/ Lower back □
   k) Others specify .................................................................
Section E: Linking swimming stroke and Injury or pain by swimmer

16. Mention the commonest injuries or pain area you experience when using the following strokes (You can select the injuries or pain areas from the one listed above). (Multiple responses are accepted)

a) Freestyle
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

b) Breaststroke
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

c) Backstroke
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

d) Butterfly
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

Thank You for Your Time
Appendix II
Questionnaire for Coaches/Trainers/Medical personnel

Dear Respondent;
My names are Kwagala Teopister a student of Makerere University, College of Natural Sciences finalizing my Degree of Bachelor of Sports Science. As part of my academic requirements, I am undertaking a research study on “Prevalence of swimming injuries among swimmers in Sir. Apollo Kagwa Schools”. You have been selected as a respondent to fill some questions for the study. This questionnaire is purely for academic purposes and you are kindly requested to spare some time on your schedule and answer the questions correctly. All your views will be kept with utmost confidentiality.

Section A: Swimming Proficiency

1. For how long have you been a swim coach?
   a) <1 □  b) 1-2 □  c) 3-4 □  d) >11 □

2. What are the common strokes taught to the swimmers?
   a) Freestyle □  c) Breaststroke □
   b) Backstroke □  d) Butterfly □

3. How many metres do the swimmers often swim?
   a) <25m □  b) 50m □  c) 100m □  d) 200m □
   e) above 200m □

4. Do you often ensure that the swimmers have adequate warm-up before training?
   a) Yes □  b) No □

5. Do the swimmers perform strength exercises as part of your training?
   a) Yes □  b) No □

Section B: Prevalence and description of previous injuries in last three swimmers

6. Do swimmers often suffer injuries?
   a) Yes □  b) No □
7. What is the extent of these injuries?
   a) acute □ 
   b) chronic □

8. When do the swimmers often suffer these injuries?
   b) Training/ Practice □ 
   b) Competition □

9. What are the commonest types of injuries suffered by the swimmers?
   a) Tendinopathy □ 
   e) Arthritis/ Synovitis/ Bursitis □
   b) Dislocation □ 
   f) Ligamentar rupture □
   c) Dislocation □ 
   g) Meniscal/ Cartilage □
   d) Sprain □ 
   h) Others ………………………………………..

Section C: Linking swimming stroke and Injury or pain by swimmer

10. Mention the commonest injuries or pain area swimmers experience when using the following strokes (You can select the injuries or pain areas from the one listed above).
    (Multiple responses are accepted)

   e) Freestyle
      …………………………………………………………………………………………………………
      …………………………………………………………………………………………………………
      …………………………………………………………………………………………………………

   f) Breaststroke
      …………………………………………………………………………………………………………
      …………………………………………………………………………………………………………
      …………………………………………………………………………………………………………

   g) Backstroke
      …………………………………………………………………………………………………………
      …………………………………………………………………………………………………………
      …………………………………………………………………………………………………………
h) Butterfly


Section D: Strategies you have undertaken to avoid reoccurrence of pain or injuries

11. How have you managed to overcome or avoid occurrence of pain or injuries?


Thank You for Your Time
## Appendix III: Work Plan

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## Appendix IV: Proposed Budget

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