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THE EFFECTS OF A FOUR-WEEK BALANCE TRAINING PROGRAMME ON DYNAMIC BALANCE AND SOCCER SKILL PERFORMANCES

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ABSTRACT

The Effects of a Four Week Balance Training Program on Dynamic Balance and **Soccer Skill Performances**

The purpose of this study was to investigate the effects of a four-week balance training programme on dynamic balance and soccer skill performances. Young soccer players from Perbadanan Kemajuan Negeri Selangor (PKNS) Football Academy (n= 30) were recruited in this study to evaluate the effects of balance training on them. The players were randomly divided into two groups (n =15 each), one control group and one experimental group. The experimental group followed a four-week balance training programme with 3 times per week, 20 minute per session. Johnson Modification Dynamic Bass Test of Dynamic Balance (JMBT) was used to assess dynamic balance ability and Loughborough Soccer Passing Test (LSPT) was used to assess soccer skill performances .A repeated measure ANOVA showed there was a significant differences at $p < 0.000$ in dynamic balance and soccer skill performances between the experimental and control groups. Paired sample t-tests indicated that there were statiscally significant improvements in experimental group on dynamic balance and soccer skill performances at $p < 0.001$ .No significant differences were found in the control group. In conclusion, balance training programme is an effective approach in soccer training to enhance player performances.

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N IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI P

TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS ii

ABSTRACT iii

LIST OF TABLES viii

LIST OF FIGURES ix

LIST OF ABBREVIATIONS x

Chapter **Page**

1. INTRODUCTION 1

1.1 Introduction 1

1.2 Statement of Problem 5

1.3 Purpose of the Study 6

1.4 Research Hypothesis 7

1.5 Significance of the Study 8

1.6 Delimitations of the Study 9

1.7 Operational Definition 10

2. LITERATURE REVIEW 11

2.11 ntroduction 11

2.2 Soccer 10

2.3 Soccer Skill Assessment 14

UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKA
DRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PEN

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N IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI P

2.4 Dynamic Balance 16

2.5 Balance Training 20

2.6 Dynamic Balance Measurement 23

3. METHODS 23

3.1 Introduction 26

3.2 Research Design 27

3.3 Conceptual Framework 29

3.4 Research Participants 30

3.5 Description of the Balance Exercise Program 31

3.6 Instrumentation 32

3.7 Pilot Test 33

3.8 Procedures 29

3.8.1 Johnson Modification of the Bass Test of Dynamic (JMBT) 35

3.8.2 Scores for JMBT 36

3.8.3 Procedures for Loughborough Soccer Passing Test (LSPT) 37

3.8.4 Scores for LSPT 38

3.9 Data Collection 39

3.10 Data Analysis 39

4. RESULTS AND INTERPRETATION 40

4.1 Introduction 40

4.2 Descriptive Analysis of the Subject 41

UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKA
DRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PEN

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N IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI P

4.3 Repeated Measures ANOVA 43

4.3.1 Repeated Measures ANOVA in JMBT 43

4.3.2 Repeated Measures ANOVA in LSPT 44

4.4 Independent sample t - test 45

4.4.1 Independent sample t-test for JMBT 45

4.4.2 Independent Sample t-test for LSPT 47

4.5 Paired sample t-test 48

4.5.1 Paired Sample t-test for Experimental Group 48

4.5.2 Paired Sample t-test for control group 49

4.6 Hypotheses Testing 51

4.6.1 Repeated measures ANOVA and

Independent sample t-test (Hypothesis testing) 51

4.6.2 Paired sample t-test (Hyphothesis testing) 52

4.7 Results Discussion 53

5. DISCUSSIONS AND CONCLUSION 43

5.1 Introduction 54

5.2 Discussion 54

5.3 Recommendation for Future Research 58

5.4 Problems Encountered During Study 59

5.5 Practical Application 60

5.6 Summary 61

5.7 Conclusion 62

UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKA
DRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PEN

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N IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI P

REFERENCES.....63

APPENDICES.....66

1. Informed Consent Form.....67
2. Demographic/Injury History Questionnaire.....69
3. Johnson Modification Dynamic Bass Test (JMBT)Layout.....71
4. Loughborough Soccer Passing Test (LSPT) Layout.....72
5. Balance Training Programme.....73
6. Data Collection Form for JMBT.....77
7. Data Collection Form for LSPT.....79
8. Research Schedule.....81
9. Balance Training Sources.....82

UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKA
DRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PEN

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N IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI P

LIST OF TABLES

Table Page

3.0 Reliability Analysis on JMBT and LSPT.....34

4.0 Descriptive analysis for all of the subjects.....41

4.1 Demographic data for experimental group and the control group.....42

4.2 JMBT repeated measures ANOVA.....43

4.3 LSPT repeated measures ANOVA.....44

4.4 Descriptive Statistics for JMBT.....46

4.5 Independent sample t-test for JMBT.....46

4.6 Descriptive Statistics for LSPT.....47

4.7 Independent sample t-test for LSPT.....47

4.8 Paired sample t-test for experimental group in JMBT and LSPT.....48

4.9 Paired sample t-test for control group in JMBT and LSPT.....50

UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKA
DRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PEN

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N IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI P

LIST OF FIGURES

Figure Page

3.0 Research Design of the Study……28

3.1 Research Framework of the Study……29

UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKA
DRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PENDIDIKAN SULTAN IDRIS UNIVERSITI PEN

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LIST OF ABBREVIATIONS

PKNS.....Perbadanan Kemajuan Negeri Selangor

JMBT.....Johnson Modification of the Bass Test of Dynamic Balance

LSPT.....Loughborough Soccer Passing Test

EG.....Experimental group

CG.....Control Group

cm.....Centimeters

Kg.....kilogram

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The game of soccer is the world most popular team sport with millions participants and spectators around the globe. Known internationally as football, soccer is the major sport in Asia, Africa, Europe and South America. Due to its popularity and financially interest, it is also one of the most extensively research in team sports (Price, Neilson & Jones, 2004). Nevertheless, this is largely based on gathering match analysis data, physiological demands, equipment and training. Limited research suggests that dynamic balance is associated with soccer skills performances. Nearly all research done on dynamic balance and soccer focused on how balance may be used as tools for injury prevention, not in sport performance (Cumps, Verhagen & Meeusen, 2007).

The concept that an athlete's ability to perform different motor skills is determined by one general motor ability .Thus, a person with high general motor ability would tend to learn motor skills more quickly than a person with low general motor ability. Balance is often regarded as motor ability which referred to an ability that is specifically related to the performance of a motor skill. Therefore, the improvements of balance may influence in sport skills performance (Magill, 2006).

Basically, balance appeared in two distinct forms: static and dynamic. Static balance refers to the maintaining of equilibrium while in stationary position meanwhile dynamic balance maintaining equilibrium while in motion (Miller, 2006). In soccer, players usually performed a series of dynamic balance because movement in soccer is realized mostly

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in unstable condition; therefore an enhancement of dynamic balance is beneficial for soccer athletes to master skills (Strand & Wilson, 1993).

Since soccer involves abrupt and intense changes in direction, as well as high frequencies of starting, stopping and physical contact, dynamic balance should be considered as one of the fundamental components of soccer, (Hobbs, 2008). Even though, dynamic balance is seemingly simple task, but it is actually a complex process involving coordination of multiple sensory, motor and biomechanical (Lucett, 2007).

Usually in performing soccer skills like dribbling, it involved motions of the ankle, knee and hip joints which are controlled by coordinated actions. This showed that dynamic balance is also associated with other motor ability such as multilimb coordination (Guskiewicz & Perrin, 1996). Maintaining dynamic balance is an advantage to retain a position and to voluntarily move, which are useful while performing soccer skills (Pafis, Ispirdilsis & Godolias, 2006).

Punakallio (2005) also agreed that balance is a complex component and describe it as the dynamics of body posture in preventing falling. This is particularly important in soccer because soccer players often performed lower extremity movements and this required a player to maintain equilibrium over time. Moreover, soccer players frequently perform single leg reaching movements outside their base of support during passing, receiving, passing, dribbling and shooting which may explain why dynamic balance in soccer player is important (Bressels, Yonker, Kras & Heath, 2007).

This component can be improved through specific balance exercise and training. Several studies proven that balance training in certain duration of times has significant effect on balance among athletes. Gioftsidou, Malliou, Pafis, Beneka, Godolias &

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Maganaris (2006) stated that there were a changes in dynamic balance abilities among soccer players following a twelve-week balance training programme compared to a group that undergone a regular soccer training . In further support of this finding, study by Yaggie and Campbell (2006) also proven that dynamic balance in soccer player was better after a six-week training programme.

Increasing in the dynamic balance may influence several functions. Firstly, it will give impact on improvement on athlete sports skills and technique; secondly, on athletes sports performances. A study by Vladimir (2006) provides evidence that special dynamic balance training exercises had positive influences for sport performance. In this study differences in sport performance was observed before and after a balance training programme. He confirmed athletes in tennis and sailing achieved better national ranking in their participation 22 % more than before dynamic balance training was practiced.

Soccer players with poor balance are at disadvantage in efficiency of performing other soccer skills. Also these individuals are at greater risk to fall and injure themselves especially in the lower extremities (Pafis,Giofsitdou,Malliou,Beneka,Ipsirlidis &Godolias, 2005). Cumps et al. (2007) studied on the efficacy of a sports specific balance training programme on the incidence of ankle sprains in basketball. It was shown that balance training was the most promising preventative tool for ankle sprains.

Similarly, Hrysomallis (2007) revealed balance training reduce the recurrence and ankle ligament injuries and anterior cruciate ligaments among male soccer players. For that reason, it is essential to know the balance ability of soccer players therefore it may help them to train effectively and as competition preparation to achieve better sports result with minimize the risk of injuries. In addition, performance of any other skills requires some degree of balance, for instance in speed and agility. When athletes have better

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agility, the easier it is to balance their movements. This showed that agility and balance is affecting one another (Daphne, 2005).

Since balance can be improved, balance tests should be used to identify players who are weak in balance. Dynamic balance can be measured either using laboratory test or field test. Numerous techniques have been described to measure balance and both of test varying levels of challenge in different populations. Laboratory test like stabilometry usually is costly, highly technical, required training to handle the equipments and often not portable (Emery, Cassidy, Klassen, Rosychuk & Rowe, 2005). Field test is more practical, besides inexpensive it also easy to administer and no equipment is needed to conduct the test .However as balance is specific to a body parts and may be specific to a sport activity , different types of balance tests should be use for diagnostic purposes (Miller, 2006).

Furthermore, to assess the effects of improvement of dynamic balance on the soccer sports skills, the soccer skill test should be on dynamic state. Although there are soccer skill tests that are popular and widely used, most of the test was actually assessing technique rather than skill. Also, some of the tests were taken in the static position and it can therefore be argued that the test does not assessing soccer skills in dynamic state (AN, Williams , Hulse , Strudwick , Reddin , Howarth , Eldred , Hirst & McGregor, 2007).

As a conclusion, dynamic balance can be used to predict future performances, indicate weaknesses and as an indicator of improvements. A soccer skills test in dynamic state were used to asses either application of balance training may enhance the improvements in soccer skills.

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1.2 Statement of Problem

Nearly all movements in soccer skills required the players to perform in dynamic state. Most of the studies found in dynamic balance were more on balance as preventative tools of sport injuries. No study found that dynamic balance is significant to soccer skills performances. Moreover, there is no literature references or research reports were found that provide any evidence on how dynamic balance effects on soccer skill performances in Malaysia. Therefore, the aim of this present study was to examine the effects of four-week balance training programme on dynamic balance and soccer skill performances.

The rationale for the present study is to look on the effectiveness of special balance training programme in improving soccer skill ability. More specifically, this study focused:

i. to examine the effects of balance training in improving dynamic balance among soccer players after four-week programme.

ii. to examine the improvements in soccer skill ability after implementation of the four-week balance training programme.

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1.3 Purpose of the Study

The purposes of this study are as follows:

Primary purpose:

i. to test the effectiveness of a four-week balance training programme on dynamic balance among soccer players

ii. to look on the effectiveness of balance training programme on the improvements of soccer skill ability among soccer players .

iii. to look on the differences between soccer players who trained regular soccer training with balance training and a soccer players who trained only on regular soccer training.

Secondary purposes:

iv. as a basis of recommendation to include specific balance training programme to enhance the performances among soccer players .

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1.4 Research Hypothesis

This study was primarily concerned with the investigation on the effects of special balance training programme on dynamic balance and soccer skill ability The study focused on the following hypothesis which is expressed in the null form:

i. There is no significant difference in dynamic balance between experimental and control group of soccer players.
ii. There is no significant difference in soccer skill performances between experimental and control group of soccer players.
iii. There is no significant difference in dynamic balance between pre and post test among experimental group.
iv. There is no significant difference in soccer skill performances between pre and post test among experimental group.
v. There is no significant difference in dynamic balance between pre and post test among control group.
vi. There is no significant difference in soccer skill performances between pre and post test among control group.

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1.5 Significance of the Study

This study was apparently the first attempt to study the effects of special balance training on dynamic balance and soccer skill ability. There is a need to increase understanding on how dynamic balance is an important component in soccer. First and foremost, this study is used to establish that balance is an important component in soccer training and proved that balance exercises is beneficial to enhance dynamic balance, which is important for the advancement of overall soccer skill ability. Most importantly, this study can be used to show the effectiveness of balance training programme on dynamic balance and soccer skill performances. This study would be necessary to contribute information on the effect of balance training to soccer skill performances, serve as data on balance training as related to soccer performances. Last but not least, it is used to provide knowledge to soccer coaches and players about the important of balance training in soccer skill performances and as a reference for future research on balance training programme, dynamic balance and soccer skill performances.

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1.6 Delimitations of the Study

The following delimitations were placed on this study:

i. The study was delimited to thirty male soccer players only, aged from 15 to 18 years old who were free from any musculoskeletal injuries.

ii. The subjects were randomly assigned to two groups as follow: one control group and one experimental group.

iii. Subjects were healthy as assessed by Pre-exercise Testing Health Status Questionnaire

iv. Only field players were involved in this study.

v. Only dynamic balance and soccer skill were tested.

vi. The Johnson Modification of the Bass Test of Dynamic Balance (JMBT) was used to measure the dynamic balance in pre and post of the studies. All measurements were performed by the investigator and the research assistants.

vii. The Loughborough Soccer Passing Test (LSPT) was used to measure the effectiveness of dynamic balance in soccer skill ability in pre and post of the studies. All measurements were performed by the investigator and the research assistants,

viii. Only male soccer players who had no other balance training activity prior to and during the entire research period are allowed to participate in this study.

ix. The study was conducted for a period of four weeks between 13th July to 9th August 2009

x. Experimental group trained three times per week and 20 minutes per session and supervised by physical trainer of the football academy.

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1.7 Operational Definition

To avoid differentiations, given below are some operational definitions as they are used in this study.

i. Balance: Balance is defined as the ability to sustain or return the body's center of gravity over its base of support (Emery et a'.,2005). Operationally, it is the ability of a soccer player to maintain a stable condition in performing soccer skills without falling

ii. Balance training: Defined as the ability to recover balance or base of support (BOS) from postural sway (body movement over BOS) following a destabilizing stimulus caused by objects, self-motion or the environment (Lucett, 2007). Operationally in this study it defined as the exercise that may help in improving dynamic balance and soccer skill ability,

iii. Dynamic Balance: Dynamic balance is defined as maintaining the equilibrium while in motion (Magill, 2006). Operationally dynamic balance in this study is the ability of a soccer player to maintain a stable condition and control movement while dribbling, running and jumping,

iv. The Johnson Modification of the Bass Test of Dynamic Balance (JMBT): A test, which has the subject to maintain balance during movement and upon landing from a leap in 10 directions (Miller, 2006). Operationally it is test to measure dynamic balance ability in soccer players,

v. Loughborough Soccer Passing Test (LSPT): A test to measure soccer skills (Ali.et al., 2007). Operationally Loughborough Soccer Passing Test is used to measure the improvements on soccer skills ability or performances after completed balance training.

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CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The game of soccer is possibly the most popular team sport in the world, with over 200 million active players and a television audience peaking at 1.7 million for the final of the FIFA (The Federation International de Football Association) 2002 World Cup Championships. One of the reasons for the global popularity of soccer is its simplicity and uncomplicated equipments requirements (Price et al., 2004). Because of the popularity of the games, there are numbers of studies done on soccer including balance. However, previous studies on balance are more concerned on the effects of balance training programme for soccer injury prevention (Pafis et al., 2006). The aim of this study was to investigate the effects of balance training programme on dynamic balance and it association with soccer skill performances.

2.2 Soccer

Soccer is officially the most popular sport in the world. The Federation International Football Association (FIFA) estimated that there are 250 million licensed players in 204 countries with 1% participation at professional level. Soccer is definitely a major global sport attracting participants and viewers from all continents. It is the national sport of most European and Latin-American countries, and of many other nations including Malaysia (Chang, Kapasi, Daisley & Leach, 2001).

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The basic concept of soccer is very simple. There are two teams (each with 11 players) and each team must advance the ball down the field and score it in their opponent's goal without using their hands or arms. The team with the most points at the end of regulation wins the game. Overall, the sport has progressed a long way. Players just keep getting better and better as the intensity of the sport just gets greater and greater. And although the concept of this sport is very simple there is so much technique and skill involved in the playing of the sport. It's definitely a sport in which need a lot of practice to be competitive (Ali et al., 2007).

Dribbling, passing and shielding are the essential skills used for maintaining possession of the ball. Dribbling skills enabled player to run past opponents and to advance the ball at speed when moving in open space. Shielding skills are used in conjunction with dribbling skills to protect the ball from opponents attempting to steal it meanwhile passing is warranted to ensure the ball is secured to bring forward to the opponent area (Luxbacher, 2005).

Success in soccer is depending on variety of factors including the physical characteristics and physiological characteristics. Each game involves changes of activity by individuals and required players to perform the changes in the course of play. Therefore it is important to know the ability of players especially in performing basic skills like kicking, passing, trapping, dribbling, tackling and heading. Analysis of physical characteristics of players and determination of the specific requirements for optimal performance is a necessity (Daphne, 2005).

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Studies on soccer grew as the sport itself. During the last two decades, there has been significant accumulation of scientific data regarding soccer physiology and medicine (McIntyre, 2004. and Bunc & Psotta, 2001). Aspects such as experience, body composition, endurance, balance between anaerobic power and aerobic are primary importance in evaluation of soccer player (Ostojic, 2003). Moreover, studies done on soccer usually are to improve on the games equipment and soccer player abilities through recommended training such as plyometrics, speed, agility, quickness and strength (Price et al.2004).

Because of the popularity and financial interest, soccer is the most extensively research on team sports (Ali et al., 2007). Even though the popularity of the games is increasing, apparently, there are no study on application of specific balance training towards soccer skill performance The significance of dynamic balance and soccer skill was always overlooked although most of the skills in soccer are performed in a dynamic balance form and even during the assessment on most of the soccer sports skill. For that reason, more research on dynamic balance should be explored to find the significant of this component towards soccer player ability and performances.

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2.3 Soccer Skill Assessment

There are numbers of soccer skill test, for instance, a Mor-Christian General Soccer Ability Skills Test Battery (1979), Johnson Soccer Test (1963), Yeagley Soccer Test (1972) and McDonald Soccer Test (1951). The skill that has usually been assessed is dribbling, passing, kicking, trapping, heading, goalkeeping and throwing (Strand, & Wilson, 1993). The result of the test may be used to determine either dynamic balance has significant influences on soccer skill or it also may be used to determine level of achievement and also to predict performances, comparative evaluation and also diagnosis performances.

McDonald soccer test is used to measure general soccer ability. This test is simple to perform where the test performer should kick the ball against the wall as many times possible for 30 seconds. This test is more suitable for high school or college age and not optional for high level athletes. Lacy and Hastad (2007) suggested a few soccer tests to measure soccer skills in soccer players. The most widely used is the soccer battery test that included four types of soccer skills: dribbling, juggling, heading and wall volley. This test is able to measure the soccer skills and has validity of .78 and reliability coefficients .64 to .91 .Nevertheless, Ali et al. (2007) claimed that one of the skills (heading) is taken more on static position and it can therefore not suitable to measure the effects of dynamic balance on soccer skill. Moreover, he claimed that the test was actually assessing more on technique rather than skill. In addition, for shooting assessment (wall volley) ,there was no information on the speed of each shot and so players could have kicked the ball at speeds less than in those in match play to achieve greater accuracy. Although there are soccer skill test that are popular with coaching organizations, these have yet to be validated and so have limited use as research tools.

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The lack of valid and reliable tests therefore has hindered research into soccer skill performances. Recognizing the limitations of the available tests, Loughborough University had developed the Loughborough Soccer Passing Test (LSPT), Loughborough Soccer Shooting Test (LSST) and Loughborough Soccer Dribbling Test (LSDT) to assess multi aspects in soccer including passing, dribbling, control shooting and decision making within the match play. The results of this study suggest that the LSDT and LSPT are reliable indicators of drilling and passing skills (McGregor, Hulse & Strudwick, 2006). Similar study by Ali et al. (2007) concluded that both LSPT and LSST have been shown to be valid and reliable methods of assessing soccer skill performances for research use.

From a practical perspective, information gained from the specific skill test is important for coaches or trainers to adjust training regimes and concentrate on the variables that are specific to improve on performances and achieve success in soccer (Ostojic, 2003).For that reason, the LSPT was chosen in this study because it is reliable to assess soccer skills in dynamic state. This test demands a range of skills including passing, controlling, handling and dribbling. Therefore it is reasonable to include this test in this study as a reflection of the skills required by soccer players. The test also has a great validity and reliability. From McGregor et al. (2006) study, they reported that LSPT has significant validity coefficient 0.64 and the reliability is 0.83. In conclusion, LSPT is suitable protocols to assess soccer skill performances.

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2.4 Dynamic Balance

Chong, Ambrose, Carzoli and Jacobson (2001) described that balance is an important function and has been recognised as an integral part of sports skills for over 50 years. They also suggested that balance has been said as the single most important component of athletic ability and should not be treated as unconnected events stringed together but rather as interrelated components. For instance, agility is interrelated to strength: the more strength and more under controlled an athlete's movements are, the more agility that athlete has. Because that athlete has better agility, the easier it is to balance and coordinate the movements (Daphne, 2005).

Balance can be found in two distinct forms, static and dynamic balance. Static balance is the ability to maintain stability with no motion involved. Dynamic balance, on the other. hand is the ability to maintain stability while in motion (Bressel et al., 2007). In order for soccer players to perform in a competition and in training, the athlete must have good balance. This is because most physical activities emphasize proper balance in order to perform the skills, athletes are required to participate in balance training and it should be done exclusively (Hobbs, 2008).

Dynamic balance involves the maintenance of equilibrium while moving. Usually, the amazing soccer athlete highlights seen on television are example of series of dynamic balance or balance in the moves (Davlin, 2004). Athlete may be able to execute skill efficiently either in competition or training if they have good balance (Lucett, 2007). Despite this, there are limited studies investigating the relationship between dynamic balance and it positive influences in sport performances.

Dynamic balance is influenced by several factors. In anatomy perspective, balance is a function of the mechanisms of the inner ear. The vestibular apparatus, which is located

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in the inner ear, is responsible for detecting sensations concerned with equilibrium. Most sports require athletes to move their heads and eyes speedily while in motion, so the importance of the vestibular apparatus is apparent (Marieb, 2000). Dynamic balance is also a product of an individual's ability to sense the skill or movements. The body often reports information about a body's position in space as well as sense of movement without visual reference. It is a complex process involving coordination of multiple sensory, motor and biomechanical components. In sum, balance is an ability of an individual sensing the position in the body in relation to gravity and the surroundings by combining visual, vestibular and somatosensory inputs (Guskiewicz et al.1996).

Besides, there are a numbers of other factors that also influenced the dynamic balance of a soccer player. First of all is the physique of the athletes. The human body is very tall structure balanced on a relatively small base and its centre of gravity is quite high. The closer the centre of gravity to the base of support the more stable a person. Conversely, the further the centre of gravity falls from the base of support, the more unstable the person is (Lucett, 2007). Secondly is foot speed, players can accelerate, decelerate, change directions or maintain balance only when one or both feet are in contact with the ground. During this motion, athletes are more prone to unstable condition. Next factor is the height of foot, soccer athletes involved in cycle of sprinting especially when they are chasing an opponent in defending and also during attacking. The high knee lift position raises the athlete centre of gravity and therefore promotes instability (Sayers, 1998).

Dynamic balance is undoubtly required in sport. Each sport requires different levels of balance to perform skills. According to Bressel et al. (2007), gymnasts and soccer players did not differ in terms of static and dynamic balance but basketball players had poorer static balance compared to gymnasts and lower dynamic balance to soccer players. This explains the different levels of sensory motor processes to perform skills.

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Gymnast always performed in predictable environment while soccer player performed skills by using lower extremities with cleated shoes and in unpredictable environment that may influences the unstable state. In contrasts, basketball players often performed upper extremity passing, shooting and dribbling wearing shoes on flat and stiff surfaces. This confirmed that the skill requirements and environmental demands likely pose different challenges to different type of sensory motor that may influence the balance abilities of the athletes.

Soccer skills is likely acquired more on dynamic balance rather than static balance, therefore it is a fundamental component in soccer because it is interrelated to other soccer skills such as rapidly changing direction, kicking and dribbling. A soccer player performs a series of dynamic balance in the games; therefore the improvement on dynamic balance enables the athletes to perform better in skill. The term skill is referred to player's ability to select, organize and execute an action appropriate to a given situation in an effective, consistent and efficient manner or in other words ability to use technique appropriately and effectively at the right moment. Having a good balance gives subtle edge on the field for soccer player and could make a difference in critical moment especially when dribbling and an opponent bumps into the player. The player should be able to shift body weight appropriately so that the player does not lose control of the ball. Therefore, to ensure the skill is accomplished well, any barriers should be reduced. This concept explains the relationship between balance and sports skill (Williams, Horn & Hodges, 2007).

Vladimir (2006) supported that achieving excellent performance is possible only with sufficient development of balance abilities because movements or skill in any sport is realized mostly in unstable condition. He recommended that improvements on athletes balance are proven to achieve better sports result. The progress is mainly in sport

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techniques, skills and personal performances. Twenty six athletes in tennis and sailing were confirmed had achieved better national ranking up to 22 percent after following special balance training.

Even so the dynamic balance is significant to soccer performances; most of the studies conducted on balance and soccer are more on balance as preventative tools in sport injury. Balance training is useful to prevent injuries especially in the lower limb. A study conducted on soccer players and balance because statistic showed that 68 to 88 % of all soccer injuries involve in the lower extremity injuries, especially the knee and ankle (Pafis etal., 2005).

Another study by Pafis et al. (2006) claimed that balance improvements protect athletes from possible forthcoming injuries. Similarly Hrysomallis (2007) also agreed that as a single intervention, balance training has been shown to significantly reduce the recurrence of injuries in soccer athletes.

In total, balance is importance to mastery sport skill because it helps soccer players to control and execute them properly. It could be said that good athletes is always in control. Soccer player are always involved in a quick moving and often perform single leg reaching movements outside their base of support, therefore they should be able to manage their movements. The application of principles of balance when performing specified sports skills in soccer is necessary to promote success (Hobbs, 2008).
Until now, the studies found which measuring balance parameters and their possible improvements after an application of a specific balance exercises programme in male soccer player was more on injury prevention and also as a preventative of recurrence injuries (Hyrsomallis, 2007). This study was focusing more on improvement of soccer skills and abilities after application of balance exercise programme among male soccer

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players. Therefore, to enhance the results gained from this study; all research participants are free from any musculoskeletal injuries especially in the lower limb.

2.5 Balance Training

It is generally accepted that the performances of soccer athlete is greatly enhanced through the use of strength , plyometrics, speed, agility and quickness training , however whether stabilization forms of training such as balance have any effect on soccer player remains unclear. Many people discount that the use of balance training by suggesting that athletes receive balance training in their practice drills and do not need to train for it specifically (Lucett, 2007).

Pafis et al. (2006) proved that additional balance training programme were effective on soccer players that followed a regular soccer training with balance training to prevent recurrence injuries more than a group that followed only regular soccer training . Similar to Gioftsidou et al. (2006), they also reported that there was no significant change on balance on control group who only involved only soccer training if compared to training group that followed a balance programme for twelve-week as a tools for injury prevention.

Regardless of the arguments, the concept of specificity has emerged as an important parameter in sport training. Although balance is a skill that is promoted with strength training, it can be improved when training for it specifically. This principle of training suggested the better way to train balance is to put body situations in which balance is pushed to the extent of stability, allowing the body to make corrections and become accustomed to the fast change in body position (Chong et al.2001). Many athletes are aware of the importance of balance training and using it as an integral part of their

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overall training programmes for performance enhancement. A study by Blackburn, Guskiewicz, Petschauer and Prentice (2000) suggested that balance training must be specific to the athletes sport, so it should involved replicating components of function associated with that sport, therefore the results is more significant to the athlete.

Several studies have proven that special training in balance may improve on athletes balance ability. Cumps et al.(2007) reported that 22 weeks intervention of balance training was performed three times a week for five to ten minutes is effective on basketball players. Another study by Pafis et al. (2006) investigated on two different balance training frequencies in improving proprioceptive ability. Thirty eight professional soccer players were randomly assigned into three groups. The results showed that both training groups improved their balance ability despite the different frequency of the balance programme. Pafis and friends proposed that balance training programme can be applied in soccer players on a daily basis or at least three times per week, according to the demands of the training period.

Dynamic balance training is important and has significant effects on sports performances. Nevertheless, limited studies found to prove the effectiveness. Vladimir (2006) proved that improvements on balance lead to better performances. Following special means and exercises on balance had improved tennis players and sailors in better national ranking which is up to 22% before balance training was implemented in the fitness preparation. Yaggie et al. (2006) also showed significant results after training in dynamic balance for four weeks. They concluded that balance training improved performance of selected sport related activities and also in postural control measures.

Dynamic balance tends to adapt to whatever skill that is being trained or performed. Balance improvements during training are refined when tasks of stability increases in

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difficulty. The more the body is put into situations that stability is continuously pushed the more the body will recognize this and adapt to the situation. The improvements are enhanced through the body working as a whole and not just one muscle or segment. Moreover, balance training was an effective alternative to regular strength training in that it not only improved balance but it also improved muscular imbalance that may have present before training.

Balance training tended to improve on balance and athletes stability as well more than strength training that was the dominant training regimen (Chong et a!., 2001). Twist (2001) stated that typical strength training to gain dynamic balance has so little to do with the real sport. He suggested athletes to train in a more unstable and unpredictable environment because real life conditions require contributions to all muscle groups. Specific balance training has more significant effects on dynamic balance than typical training that has been said to be associated with balance.

All in all, balance training is an essential factor to improve on dynamic balance and it may be use to determine the enhancement of the soccer skills performances. As suggested by past studies, balance training should replicate the movements in sports, in this case soccer therefore it is possible to achieve better results after the application of training. In addition, the analysis of data in few past studies showed that significant gains were made as a result of practice of balance training for only four-weeks. It can be concluded that balance can be practiced and improved over short periods of time.

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2.6 Dynamic Balance Measurement

Dynamic balance is the ability to maintain equilibrium while in motion or to move the body or parts of the body from one point to another and maintain equilibrium (Punakallio, 2005). As been mentioned earlier, dynamic balance is necessary for successful performance in sport. In fact, all human motion occurs as a result of the disturbance of the body's balance. Thus, since performance of any physical activity requires some degrees of balance and since balance can be improved, balance test should be used to identify those individuals with poor balance. Balance is specific to body parts and may be specific to a sport; different type of balance test should be used for diagnostic purposes (Miller, 2006).

A study stated that dynamic balance test can be either field test or laboratory test. Laboratory test usually is costly, highly technical, and often not portable and field test is more practical besides inexpensive and easy to administered (Emery et al. 2005). Examples of test for dynamic balance that are commonly used includes Stabilometer (2005), Balance Error Scoring System (BESS ,2006), Biodex Stability System (BSS, 2005), Star Execution Balance Test (SEBT ,2006), Johnson Modification of the Bass Test of Dynamic Balance (JMBT, 2001) and Balance Beam Test (1996) .Since there are several choices in dynamic balance test, Tsigilis, Zachopolou and Mavridis (2001) evaluates the specificity of selected dynamic balance test. They compared between laboratory test and field test. The test includes Stabilometer (laboratory test) and three field test: the Modified Bass Test Balance Beam Speed Test 1 and Modified Bass Test Balance Beam Speed Test 2. They concluded that different test measure different feature of dynamic balance. This is because balance is specific to a body part or parts and may be specific to a sport or physical activity, different type of balance tests should

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be used for different diagnostic purpose. Laboratory test are more suitable for injury and rehabilitation assessment and field test was proper to be used in sports setting.

For example , the BESS is a clinical field test that can be used for sideline evaluations of an athlete's postural stability after a mild head injury. It was developed to provide health care professionals to assess postural stability outside the laboratory. The BESS measures an athlete's postural stability through a clinical-assessment battery and is scored by counting the errors the athlete commits during the tests (Wilkins, Valovich, Perrint & Gansneder, 2004). Another clinical test that is commonly used in balance measurement is SEBT. The SEBT measures the stability of the lower extremity where participants should reach their toes as far as possible to the directions of 0, 90 and 180 degree line while maintaining balance. The scores of the SEBT were recorded with the longest lengths of all 3 directions averaged to be the total score. Both SEBT and BESS test are more suitable to measure injuries rather than sport performances.

Miller (2006) suggested several field tests that can be conducted to measure dynamic balance and it is more related to sports movement such as Modified Sideward Leap and Johnson Modification of the Bass Test of Dynamic Balance (JMBT). Both of the tests are used to measure the ability to maintain balance during movement and upon landing from a leap. The test is easy to administer and do not require high technology equipments. Only stopwatch, tape measure and floor tape are required.

An important factor to be aware of during conducting dynamic balance test is to know the athletes condition. Study by Wilkins et al. (2004) proven that participants are more likely to perform the test with more error after a fatigue protocol has been implemented. The main reason why this happen is postural stability decreased acutely after isolated

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muscle fatigue and whole body (central) fatigue. Dynamic balance should not be conducted when the participants are tired or has just finished other activities.

Moreover, it is advisable to perform the test first before conducting other test. Another important factor before the test is conducted is the participants should follow a familiarization phase before the real test started. This is to ensure the participants understand the test and also to enhance the validity and reliability of the test (Sato and Butcher-Mokha, 2006).

From the literature, it can be concluded that the selection of balance test is depends to the diagnostic purpose. For instance, in this present study the main purpose of the assessment is to measure the dynamic balance among soccer player. Thus, the test should include the characteristic of the sports or at least mimic the movements in soccer. As a result, JMBT were chosen as the test has a similarity in soccer movements.

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CHAPTER 3

METHODOLOGY

3.1 introduction

A research in soccer has increased steeply due to popularity and interests of the spectators and participants all over the world (Price et al., 2004). Nevertheless, no study found in the ability of dynamic balance to improve on soccer skill performances. This present study was conducted to attain research evidence on the effectiveness of a four-week balance training programme towards improving dynamic balance and soccer skill performances. A Johnson Modification of the Bass Test of Dynamic Balance (JMBT) was used to measure the participants dynamic balance ability meanwhile Loughborough Soccer Passing Test (LSPT) was used to measure sport skills performances. To make this study useful, certain considerations have been made in the selection of research participants. The 30 research participants were purposively sampling from Perbadanan Kemajuan Negeri Selangor (PKNS) Football Academy to ensure the research participants was equal during beginning of the test since the research participants had received equal training frequency and protocols.

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3.2 Research Design

This study used repeated measures to compare the effects of balance training on dynamic balance and soccer skill performances on the soccer players during pre and post test. Thirty soccer players (n=30) were randomly assigned into two groups: control group (n = 15) and experimental group (n=15) The independent variables is balance training, dynamic balance and soccer skill performances meanwhile the dependent variables were both of the control group and experimental group. Experimental group followed the treatment in four-week. Measurements were recorded as pre-treatment and post-treatment for both groups. Each subject attended a familiarization trial (prior to the test) to familiarize them to JMBT and LSPT.

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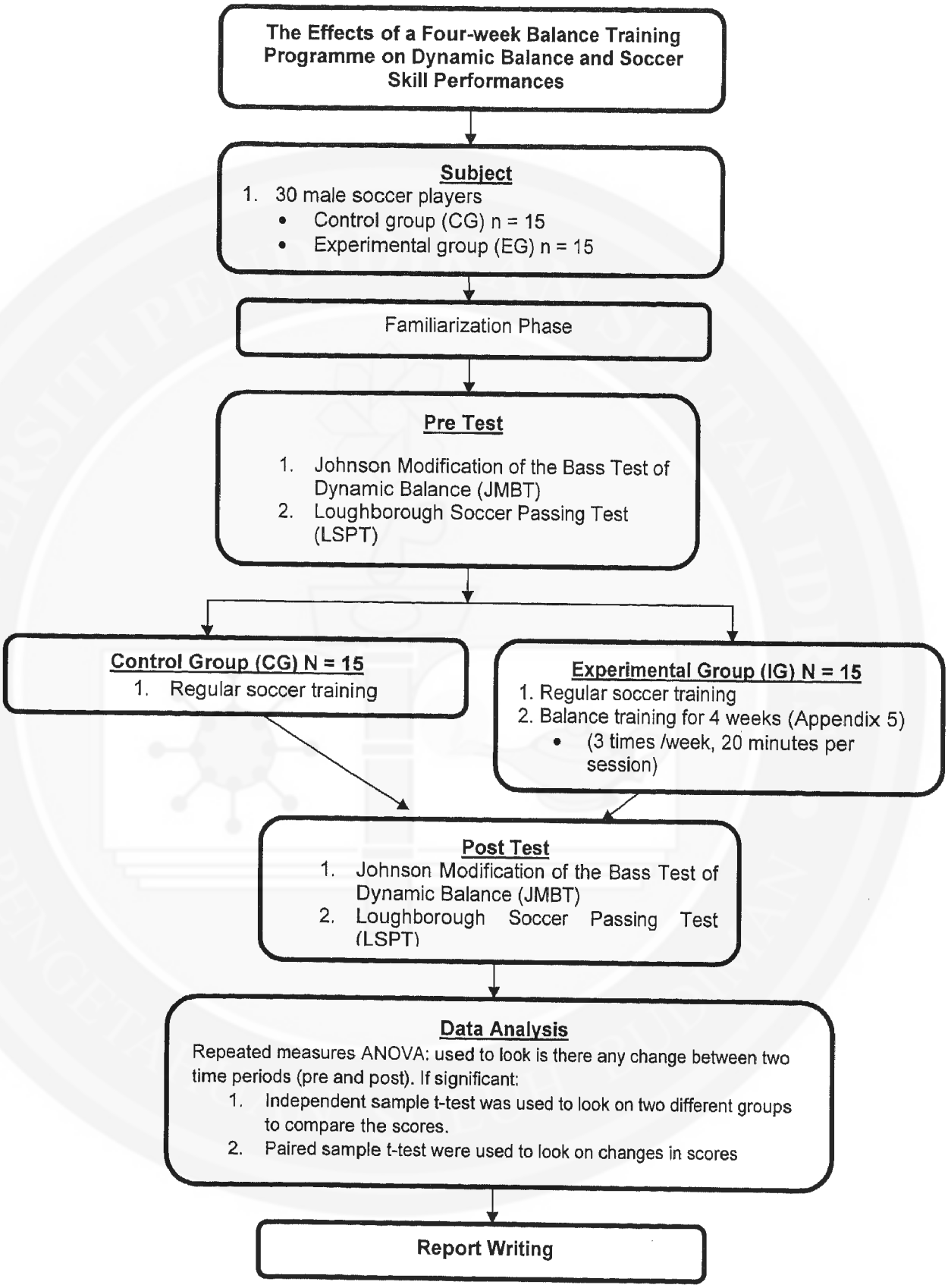


Figure 3.0 Research Design of the study

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3.3 Conceptual Framework

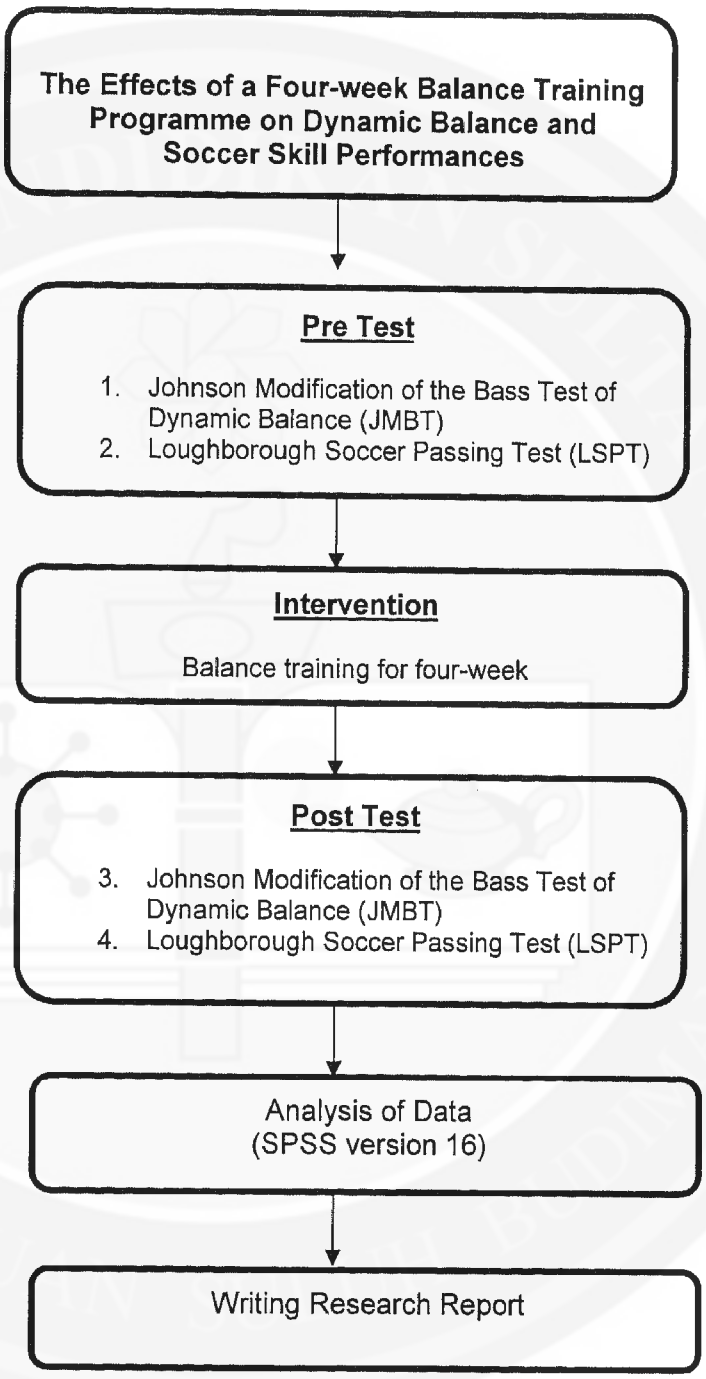


Fig. 3.1 Research Framework of the study

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3.4 Research Participants

Subjects included thirty male soccer players between the ages of 15 and 18 years who were purposive sampled from PKNS football academy. The main reason why these particular athletes were chosen in this study was to ensure that both of the groups are equal in the beginning of the study since they had received the same frequency and training dose. Next, the soccer players were randomly assigned into two groups, one control group (CG) and one experimental group (EG). Experimental group undergo a regular soccer training with additional balance training programme for four-week, there times per week , 20 minute per session. The control group followed only regular soccer training. The control group was used in order to check if soccer training alone can improve balance ability significantly.

All subjects were informed about the purpose of the study and had read, signed, and dated the informed consent document (Appendix 1) before being allowed to participate in the study. Subjects completed a health history questionnaire to determine eligibility for the study. Subjects who had musculoskeletal injuries and undergoing any other balance training were excluded from participate in this study (Appendix 2).

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3.5 Description of the Balance Exercise Programme

This study consisted of a control group and one experimental group that performed a regular soccer training and regular soccer training with balance training programme respectively for four weeks. The subjects in the experimental group met three times per week on alternating days to perform the training programme. The estimated time for completing the training programme was approximately 20 minutes per session. Meanwhile, the control group did not perform any balance exercises except the regular soccer training.

The exercise programme was designed by the researcher specifically for this present study by using principles of training (specificity and progression). The main goal while designing the exercise programme was to include skills that improve awareness during jumping and landing which are important soccer skills and technical elements The subjects began with simple exercise and progresses from day to day and week by week (Appendix 5). The subjects performed the balance training program three times per week on alternating days and performed repetitions and sets accordingly to the specific exercise. The exercise protocol used in this study was derived from those sources in Appendix 9.The exercises started at lower level which consisted of exercises in a stationary position with static contractions and then progressing to slow movements in an unstable environment.

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3.6 Instrumentation

JMBT was chosen to measure the ability to maintain balance during movement and upon landing from a jump. As reported by Miller (2006) this test required the athlete maintain their base of support with one leg, reaching in ten directions with the other leg without compromising their base of support on the stance leg and hold for 5 seconds on each station. Miller (2006) reported that JMBT has a reliability level of .75 levels and face validity of .46.The test consists of 100 points with a maximum 10 points were given for each mark. This test is easy to minister because it required less instruments or apparatus. Only floor tape was used to mark the floor and measuring tape to design the pattern for JMBT as illustrated in appendix 3. Casio Digital Stopwatch Hs-6-1ef was used to determine the 5 seconds hold for each marks attempt. Hobbs (2008) has also used this test in assessing dynamic balance on basketball players and found that this test were suitable to be used in sports setting.

Appendix 4 illustrated the layout of LSPT. Four standard gymnasium benches were placed as shown on each of the four lines marking the 12 meter X 9.5 meter grid to the inside of the benches. Before their placement, four coloured (green, blue, red and white) were taped to the middle of each bench. In addition, silver tape (0.1 meter X0.5 meter) was taped vertically in the middle of target areas. Yellow mark was also used to mark the inner (1X2.5m) and outer (2.5 meter X 4 meter) rectangles and the passing zone was the area between these lines. Coloured zones were used to distinguish the different zones, with a further cone situated in the middle of the inner rectangular grid. The LSPT required players to complete 16 passes as quickly as possible. Casio Digital Stopwatch Hs-6-1ef was used to record the time taken by the players to complete the test. A tape measured was used to measure the distance and design the floor pattern. McGregor et

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al. (2007) reported that LSPT test is a valid and reliable test to assess soccer skill performances. The reliability of the test was .83, and the validity was .64.

3.7 Pilot Test

A pilot test was conducted in the early week of 29th August 2009 for the purpose of examining the measurement of Johnson Modification of the Bass Test of Dynamic Balance (JMBT) and Loughborough Soccer Passing Test (LSPT) .Participants were university students majoring in Bachelor of Sports Science. Fifteen students participated in this pilot study is active students involved in soccer recreationally. All participants were male with age ranged from twenty to twenty two years old. The main reason to conduct the pilot test was to identify potential problem areas and deficiencies in the research instruments and protocol prior to implementation during the full study and familiarization with the procedures in the protocol.

A JMBT was selected tool to assess dynamic balance and LSPT were used to assess the soccer skill performances. An explanation and demonstration of the test were given prior to the test and each subject has two trials for each test. One research assistant (student from Master of Sports Science, Universiti Teknologi MARA) was appointed in this pilot study to help in collecting data and also to administer the test.

Analysis of data for the pilot study was made and the results appear in Tables 3.0.The JMBT has good internal consistency, with a Cronbach alpha coefficient reported of .77. Similarly, the LSPT also has a good internal consistency, with a Cronbach alpha coefficient reported of .83.

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Table 3.0 Reliability analysis on JMBT and LSPT

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Test
.833	.883	JMBT
.770	.785	LSPT

3.8 Procedures

Participants were informed the purpose of the study. All testing were administered and supervised by the administrator and research assistant. Research assistant were appointed for this study to assist in data collection and conducted the test. Prior to recording measurements for the pre-test and post-test on the JMBT and LSPT, an explanation of each test was briefed to the subjects and a demo test was conducted. Administrator explained on how errors were classified. All subjects participated in a familiarization test. The pre test was conducted prior to the four-week balance training while the post test was conducted after the treatment.

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3.8.1 Procedures for Johnson Modification of the Bass Test of Dynamic Balance (JMBT)

i. Participants were required to perform a warmed up before the test was conducted and undergo a familiarization before the actual test,

ii. Each participant had three trials on the JMBT.

iii. In this test, eleven pieces of tape were placed in the pattern as shown in appendix 3.

iv. Firstly the test performer stood with the right foot placed on the starting mark. In the second step, the performer jumped to the first tape mark and landed on the ball of the left foot and holds it for five seconds,

v. The test continued to the other tape marks with alternating feet and attempting to hold steady position for five seconds,

vi. The ball of the foot must completely cover the tape. The test administrator should counted aloud the seconds of each balance,

vii. The data was recorded on a score sheet (appendix 6).

viii. Participants had at least 5 minutes rest before performing the next trials. After they had completed the test, the participants were required to stretch and warmed down.

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3.8.2 Scores for JMBT

The test scoring was given based on two criteria.

i. 5 points will be given for landing successfully on the tape mark. Secondly, 1 point is given for each second the steady position is held on tape marks,

ii. A maximum 10 points per tape mark and 100 points for the test may be earned,

iii. Any landing errors were penalized by 5 points. The landing error could be defined as failing to stop upon landing, touching the floor with any parts of the body other than the ball of the landing foot and failing to completely cover the tape mark with the ball of the foot,

iv. However, if the test performer makes a landing error, it could still assumed correct balance if the performer could hold for maximum five seconds,

v. If the performers landed accordingly but committed any errors before completing five seconds, 1 point will be deducted. The errors included touching the floor with any part of the body rather than the ball of the landing foot and failing to hold it for five seconds,

vi. If the performer lost balance, the test performer would return to the proper mark and jump to the next mark.

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3.8.3 Procedures for Loughborough Soccer Passing Test (LSPT)

i. The participants began with the ball (Nike Total90 OMNI Soccer Ball) by the central cone, and the first examiner started timing the test, using a handheld stopwatch (Casio Digital Stopwatch Hs-6-1ef) from the moment the ball was touched forward out of the inner rectangle.

ii. The participants were required to perform 16 passes as quickly as possible.

iii. The next target was called by the second examiner just before the participant completed the current pass. The order of the passes was determined by one of the four trials that were randomly generated by the investigators so that each trial consisted of eight long (green and blue) and eight short (white and red) passes.

iv. The passes could only be executed from within the passing area, between the set of marked lines (Appendix 4). The ball had to cross two of the inner marked lines before the next pass could be attempted.

v. The participants should perform the test as quickly as possible while making the fewest mistakes.

vi. The second examiner stopped the clock when the last pass made contact with the target area and record penalty time points accrued during trials.

vii. The examiner stood in the position where all four target areas could be viewed,

viii. The data was recorded on a score sheet (appendix 7).

ix. Participants had at least 5 minutes rest before performing the next trials. Participants were required to stretch and warmed down on completion of the test.

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3.8.4 Scores for LSPT

A penalty was given if the participants made an error during the test as shown in the following:

i. Plus 5 second for missing the bench completely or passing the wrong bench
ii. Plus 3 second for missing the target areas (0.6meter X 0.3 meter)
iii. Plus 2 second for handling the ball
iv. Plus 2 second for passing the ball from outside of designated areas
v. Plus 1 second if the ball touched any cone
vi. Plus 1 second for every second taken over the allocated 43 second to complete the test
vii. One second deducted from the total time if the ball hit 10cm strip (appendix 4) in the middle of the target

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3.9 Data Collection

A period of four week ie: from 13th July to 9th August 2009 (Appendix 8) was allocated for data collection. The independent variables are dynamic balance and soccer skills were assessed by using JMBT and LSPT respectively The two sets of data collected from this present study were recorded on the data collection form as illustrated in appendix 6 and 7. Both control and experimental group undergo the same test for pre and post.

3.10 Data Analysis

SPSS version 16 software was used for statistical analysis. A repeated measures ANOVA were used to look is there any change between two time periods between groups (pre and post). Since the results from the repeated measures ANOVA is significant, an independent sample t-test were used to look on two different groups to compare the scores. Paired sample t-test was used to look on changes in scores pre and post test within the groups. Alpha was set at 0.005 for all comparisons.

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CHAPTER 4

RESULTS AND INTERPRETATION

4.1 Introduction

The main objective of this study was to investigate the effects of balance training on dynamic balance and soccer skill performances. The soccer players were randomly assigned into experimental group (EG) and control group (CG). Experimental group were trained on balance with regular soccer training and control group followed a regular soccer training only. Both groups were tested on the Johnson Modification of the Bass Test of Dynamic Balance Johnson (JMBT) and Loughborough Soccer Passing Test (LSPT) during pre and post of study.

SPSS version 16 was used to analyze the data. The JMBT and LSPT data were analyzed using the repeated measures ANOVA. Since the results from the repeated measure ANOVA is significant, additional analyses were conducted, independent sample t-test was used to strengthen and enhance the results gained from the repeated measures ANOVA. Independent sample t-test was also used to look on the mean scores of two different groups meanwhile paired sample t-test used to compare the mean scores on experimental and control group.

The data analysis was organized as follows. The first part discussed the descriptive analysis and the demographic data of the research participants. Descriptive statistics such as mean and standard deviation were used to describe the age, height, weight and the result of the JMBT and LSPT test.

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The second part of this chapter discussed the inferential statistics in the form of repeated measures ANOVA, independent sample t-test and paired sample t- test and hypotheses testing. The last part discussed on the interpretation of the statistical analysis.

4.2 Descriptive Analysis of the Subject

Table 4.0 illustrate the descriptive analysis of all participants with the total number of 30.The sample was selected using purposive sampling with the mean age of 16.47 ± 1.008 years , mean height is 167.8 ± 5.7 centimetres and mean weight 65.23 ± 6.8 kilograms . The participants were randomly divided into two groups, 15 soccer players for each group. There was no dropout in this study.

Table 4.0 Descriptive analysis for all of the subjects

	N	Mean	Std. Deviation
Group	30	1.50	.509
Age (years)	30	16.47	1.008
Height (cm)	30	167.80	5.696
Weight (kg)	30	65.23	6.816

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The demographic data as presented in table 4.1 showed both groups did not differ significantly with respect to age, height and weight. The experimental group mean and standard deviation for age, height and weight were 16.80 ± .862 years , 168.40 ± 6.4 centimetres and 66.13 ± 8.6 kilograms respectively while for the control group, the mean and standard deviation for age, height and weight are 16.13 ± 1.060 years , 167.20 ± 5.1centimetres and 64.33 ± 4.5 kilograms respectively.

Table 4.1 Demographic data (age, height and weight) presented for both experimental group and the control group.

Group		N	MEAN	STD.DEV
EG	Age (years)	15	16.80	.862
	Height (cm)	15	168.40	6.356
	Weight (kg)	15	66.13	8.643
CG	Age (years)	15	16.13	1.060
	Height (cm)	15	167.20	5.102
	Weight (kg)	15	64.33	4.451

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4.3 Repeated Measures ANOVA

Repeated measures ANOVA was conducted to look if there any changes in JMBT and LSPT used to look is there any change between two time periods (pre and post).

4.3.1 Repeated Measures ANOVA in JMBT

A repeated measures ANOVA was conducted to compare scores on the JMBT test between two time periods. The results for the JMBT repeated measures ANOVA were shown in table 4.2. The results indicate there was a significant effect for time, Wilk's Lambada = 42, F (1, 28) = 38.987, $p < 0.005$.

Table 4.2 JMBT Repeated Measures ANOVA Analysis

Effect		Value	F	Hyphothesis df.	Error df	Sig.
TIME	Wilks' Lambda	.418	38.987[a]	1.000	28.000	.000

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4.3.2 Repeated Measures ANOVA for LSPT

A repeated measures ANOVA was conducted to compare scores on the LSPT test at pre and post. The results for the LSPT repeated measures ANOVA were shown in table 4.3. The results indicate there was a significant main effect for time, Wilks' Lambda = .53, F (1, 28) = 38.987, $p < 0.005$.

Table 4.3 LSPT Repeated Measures ANOVA Analysis

Effect		Value	F	Hyphothesis df.	Error df	Sig.
TIME	Wilks' Lambda	.533	24.561[a]	1.000	28.000	.000

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4.4 Independent Sample t-test

Since the result in repeated measures ANOVA is significant, additional analysis was conducted to enhance and strengthen the results gained from the repeated measures ANOVA. An independent sample t-test was used to identify and to compare the mean score on the two groups.

4.4.1 Independent Sample t-test for JMBT

An independent sample t-test was conducted to compare the JMBT scores for experimental and control group. The mean and standard deviation of JMBT was reported in the table 4.4. From the table 4.5, the analysis showed there is significant difference in scores for experimental group M = 75.33, SD= 5.5 and control group M = 66, SD=6.0; t (28) =4.4, 16, $p < 0.005$. The magnitude of the differences in the means (means difference) = .9333, 95% CI: 5.0 to 13.65.

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Table 4.4 Descriptive Statistics for JMBT

	Group	Pre	Post
JMBT	EG	66.33±5.8	75.33±5.5
	CG	66.67±5.6	66±6.0

Table 4.5 Independent Sample t-test for JMBT

	Levene's test for equality of variances		t-test for equality of means						
	F	Sig.	t	Df	Sig(2 – tailed)	Mean Difference	Std.error Difference	95% Confidence Interval of the difference	
								Lower	Upper
JMBT PRE	.069	.794	-.160	28	.874	-.333	2.078	-.4590	-.3293
JMBT POST	.033	.856	4.427	28	.000	.9333	2.108	5.015	13.652

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4.4.2 Independent Sample t-test for LSPT

An independent sample t-test was conducted to compare the LSPT scores between experimental and control group. The mean and standard deviation of LSPT was reported in the table 4.6. From the table 4.7, the analysis showed there is significant difference in LSPT scores for experimental group M= 1.01, SD = .215 and for control group is M = 1.32, SD = .156; t (28) = -3.56, p< 0.005. The magnitude of the differences in the means (mean difference) = -.24, 95% CI: -.38 t0 -.10.

Table 4.6 Descriptive Statistics for LSPT

	Group	Pre	Post
LSPT	EG	1.3 ± .15	1.0 ± .21
	CG	1.2 ± . 24	1.3 ± .16

Table 4.7 Independent sample t-test for LSPT

	Levene's test for equality of variances		t-test for equality of means						
	F	Sig.	t	Df	Sig(2 –tailed)	Mean Difference	Std error Difference	95% Confidence Interval of the difference	
								Lower	Upper
LSPT PRE	1.462	.237	1.193	28	.243	.08800	.07377	-.06311	.23911
LSPT POST	.076	.785	-3.555	28	.001	-.24333	.06844	-.38353	-.10314

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4.5 Paired Sample t- test

In view of the fact that the results are significant between the groups, additional analysis was used to explore the relationship in further. Paired sample t-test was conducted to show the differences between two scores measured on two occasions, in this case, pre and post of the study.

4.5.1 Paired sample t-test for Experimental Group

A paired sample t-test was conducted to evaluate the impact of the balance training intervention on experimental group scores on the JMBT and LSPT. Mean and standard deviation was reported on table 4.8 for JMBT and 4.4 for LSPT.

There was a statiscally significant increase in JMBT scores from pre 66.33± 5.8 to post 75.33± 5.5, t (14) = -7.4, p = <.005. The mean increase in JMBT scores was 9.00 with a 95 % confidence interval ranging from – 11.606 to – 6.394.

Table 4.8 Paired Samples T-test for experimental group in JMBT and LSPT

Group			Paired Differences			
			Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)
EG	JMBT	Pre Post	4.706	1.215	-7.407	.000
	LSPT	Pre Post	.23049	.05951	4.010	.001

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Meanwhile, the scores for LSPT also had a significant change, there was a statiscally significant decrease in LSPT scores from 1.3 ± .15 minute to 1.0 ± .21 minute during post test with t (14) = 4.0 , p = <.001 . The mean decreases .24 with a 95 % confidence interval ranging from .11102 to .36631.

These results suggest that balance training really does had an effect on dynamic balance and soccer skill performances. Specifically, the results suggest application of four-week balance training had improved the participant's dynamic balance and soccer skills.

4.5.2 Paired sample t-test on LSPT for Control Group

The scores for JMBT as presented in Table 4.9 among control group showed no change on JMBT scores where the mean and standard deviation were 66.67± 5.6 on pre test and 66.00± 6.0 during post, t (14) = .695, p > .499. The mean slightly decrease .667 with a 95 % confidence interval ranging from – 1.391 to 2.725.

The score in LSPT also had no significant effects even though there was a slight change on the score where the mean during pre is 1.2 ±. 24 minute and post is slightly higher 1.3 ± .16. minute .The mean differences is -.09267 with a 95 % confidence interval ranging from -.15801 to -3.042. Therefore there was no significant changes in scores for control group in LSPT with t (14) = -3.042, p = 0.09.

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The results suggest that regular soccer training on control group does not improved on the dynamic balance and also does not influenced in soccer skill performances. The results from this analysis displayed the participants in the control group remain constant on their dynamic balance ability and also the skill performances.

Table 4.9 Paired Samples T-test for control group in JMBT and LSPT

Group			Paired Differences			
			Std. Deviation	Std. Error Mean	t	Sig. (2-tailed)
CG	JMBT	Pre Post	3.716	.959	.695	.499
	LSPT	Pre Post	.11799	.03046	-3.042	.009

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4.6 Hyphothesis Testing

There were six hypotheses in this study and in the null form. The analysis used to answer the six hypotheses in this study.

4.6.1 Repeated Measures ANOVA and Independent Sample t-test (Hyphothesis Testing)

Results from the repeated measures ANOVA and independent t-test indicate there was a significant differences between experimental and control group on dynamic balance with significance value at $p < 0.005$ and there was a significant differences between experimental and control group on soccer skill performances with significance value at $p < 0.005$. Therefore it rejected the Hyphothesis 1 and 2 which are:

i. There is no significant difference in dynamic balance between experimental and control group of soccer players
ii. There is no significant difference in soccer skill performances between experimental and control group of soccer players.

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4.6.2 Paired Sample t-test (Hyphothesis Testing)

Results from the paired sample t-test on experimental group indicate significant differences on dynamic balance and soccer skill performances. Therefore it rejected the Hyphothesis 3 and 4 which are:

i. There is no significant difference in dynamic balance between pre and post test among experimental group
ii. There is no significant difference in soccer skill performances between pre and post test among experimental group.

The paired sample t-test also answered hyphothesis 5 and 6 where there are no changes on dynamic balance and soccer skill performances among control group. Therefore it accepted the hyphothesis 5 and 6 which are:

i. There is no significant difference in dynamic balance between pre and post test among control group
ii. There is no significant difference in soccer skill performances between pre and post test among control group.

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4.7 Results Discussion

From the analysis, it is obvious that experimental group had performed better in post test compared to control group who remained stable during pre and post test. Even though before training there were no differences in the JMBT and LSPT mean scores between experimental and control group, on completion of the four week balance training programme, a significant difference was noted on JMBT and LSPT. Additional analysis was needed to look at the differences on pre and post scores between experimental group and control group. As a result, the changes between two groups are more visible and clearer to be observed.

The mean scores on JMBT for experimental group are slightly higher than the control group. Also the experimental group had improved on the time taken to complete the LSPT where the time taken is slightly lower if compared to the pre test. Conversely, the control group mean scores remain stable on both time periods.

At the onset of training the mean score for JMBT of the experimental group was 66.33± 5.8 and had increased to 75.33+ 5.5 after the training. The control group had not improved with mean 66.67± 5.6 at the beginning and remained at the similar level at the end of study where the mean on JMBT was 66.00± 6.0. Similarly in LSPT, the experimental group scores indicate improvement from 1.3 ± .15 minute to 1.0 ± .21 minute. However, the control group remained at the same level, 1.2 ±. 24 minute to 1,3 ± .16 minute.

The results suggest that an application of balance training with regular soccer training had a positive influenced on dynamic balance and soccer skill performance. Regular soccer training does not improved on dynamic balance, therefore no significant relations with improvement of soccer skills.

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CHAPTER 5

DISCUSSIONS AND CONCLUSIONS

5.1 Introduction

The purpose of this study was to evaluate the effects of a four-week balance training programme on dynamic balance and soccer skill performances. This study used repeated measures ANOVA to look is there any change between two time periods (pre and post), independent sample t-test used to enhance and strengthen the results from the repeated measures ANOVA , also to look on two different groups mean scores and lastly, paired sample t-test used to look on changes in scores between experimental and control group .

5.2 Discussion

The main finding of this study is there are significant differences among experimental group after 4 weeks of balance training. Although a small sample size was involved, the dynamic balance and soccer skill ability increased with the mean score for JMBT increased from 66.33 ± 5.8 to 75.33 ±5.5 and little improvement in LSPT with the mean 1.3 ± .15 minute to 1.0 ± .21 minute in post test. No differences were found at $p > 0.005$ in dynamic balance ability and soccer skill performances between pre and post test in the control group.

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There were six hypotheses in this study and in the null form The first hyphothesis stated that there is no significant difference in dynamic balance between experimental and control group of soccer players and the second hyphothesis is there is no significant difference in soccer skill performances between experimental and control group of soccer players . The third hyphothesis stated that there is no significant difference in dynamic balance between pre and post test among experimental group and the fourth hyphothesis was there is no significant difference in soccer skill performances between pre and post test among experimental group. The results rejected the null hyphothesis 1, 2, 3 and 4 because there were significant differences on JMBT and LSPT as the effects of the four-week balance training programme.

The results accepted the fifth and sixth hypotheses that stated there is no significant difference in dynamic balance between pre and post test among control group and there is no significant difference in soccer skill performances between pre and post test among control group.

From the results, it suggested that the four-week balance training had an effect on dynamic balance and soccer skill performances and a regular soccer training only does not improved the dynamic balance ability . The results suggest that the application of the four-week balance training had improved the participant's dynamic balance and soccer skills. To support this notion, Yaggie et al. (2006) claimed that balance training improved performance of selected sport related activities after a four- week of balance training programme among high school athletes. Chong et al. (2001) also applied four-week balance training on soccer player with frequencies of 3 times per week There were changes among the participants when they indicated progressed in their balance ability in sports skill after the treatment. A four-week training protocol was also used by Roth,

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Miller, Ricard, Ritenour and Chapman (2006) showed that improvements in a single leg balance ability following the completion of the treatment. Other literatures provide varieties of duration of training. Cumps et al. (2007) recommended the use of balance training as a routine in basketball. The result showed the intervention group was gradually increased with respect to the difficulty of the balance skill after 22 weeks of training. Overall, it is proven that when the experimental group in this study participated in a four-week training program their dynamic balance improved as measured by a JMBT and in soccer skill as measured by LSPT.

There are several factors that may influence enhancement of balance among experimental group. The primary factor for the changed is because of the training stimulus, the participants have put the body in situations in which balance is pushed to the extent of stability and allowing the body to make corrections and become accustomed to the fast change in body position. Guskiewicz et al.(1996) suggested that balance training manipulated the subject's motor coordination which involves athlete's ability to make postural adjustments according to selective attention, reaction time, movement time, agility and motivational arousal. Meanwhile, Bressel et al (2007) claimed that joint position (proprioception) learned to pay attention to biomechanical cues and may become the mechanism for this change as well as the training experiences itself are most likely leads to improvement of balance.

In sports training, the concept of specificity has emerged as an important parameter in determining the proper choice and sequence of exercise in a training program. Balance exercises should be specific to the sport in which the athlete competes to increase the chances of success. Balance training should be relevant and appropriate to the sport in order to produce a training effect. The athlete should participate in exercises that progressively challenge her or his dynamic balance and postural control to force an

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adaptation (Lucett, 2007).The experimental group in this present study had been trained with progressive balance exercises and tailored to the exact demands of the dynamic balance for soccer. This allowed for specific gains to be made on the stability employed after the training.

Most importantly, Ali et al (2007) stated that soccer skills were performed in a dynamic state and required a unipedal posture to perform different technical movements like dribbling, shooting and passing. The stability of the supporting of foot turns out to be critical to shoot as accurately as possible. Since the training programme in this study used exercises that were skill specific to the sport of soccer, the experimental subjects' bodies were conditioned to enhance movement patterns needed for soccer activities.

A better test result was also associated with previous physical activity and with younger age. All of them are free from any foot injuries and therefore they may have good stability naturally (Davlin, 2004). Nevertheless, it can be said that the performances were different among groups simply because of the training stimulus.

Despite the lack of findings in the present study, dynamic balance would logically be expected to have an effect on playing ability especially for sports in which athletes are moving, turning, twisting, jumping, stopping, accelerating and decelerating.

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5.3 Recommendation fpr Future Research

There are a few recommendations for future research in this topic. Firstly, futures studies may employ different position in soccer like defender, midfielder, goalkeeper and striker and determine whether differences exists by positions and determine how crucial is dynamic balance in different position therefore more comparison can be made by the researcher.

The next suggestion for future research on dynamic balance is balance training programmes should be adjusted to the peculiarities of each sport and simulating its activities. For example in soccer, the balance exercises may involve dynamic balance ability and certain soccer skills like kicking and heading. Balance training tasks must be specific to the type of balance strategies required by the sport to gain a maximum benefit from the programme.

Furthermore, different types of balance exercises designed should be tested and the future researcher can make a comparison between different sports, for instance in rugby and soccer to determine who will gained more benefits on the training protocol. What must be further considered are the training intensity, volume and duration.

Besides, there is a need in sports dynamic balance measure to quantify balance ability among athletes. It would be valuable in sports setting to develop a specific dynamic balance test. Specific test may be used to assess dynamic balance in different type of sports therefore the test would be more reliable and valid for the assessment of balance. This is because most of the balance tests available have different type of purpose, mainly for injury assessment and for elderly postural gait. Few of tests are suitable to assess dynamic balance in sports such as Johnson Modification of the Bass Test of Dynamic Balance (JMBT) and Modified Sidewarp Leap. Test like Stabilometer and Star

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Execution Balance Test is not precise and doesn't have high correlation to assess balance in sports skill. Furthermore, instead of developing laboratory test, a field test is more practical because the movement is more specific to the sports skill itself and has real environment stimulus.

Another important recommendation is when assessing balance and sports skill is it should not be conducted when athlete is fatigue and tired. Balance test should be conducted before any other assessment because fatigue will affect on balance ability. If the test needs several times of trial, then rest between tests is advisable. This situation also is applicable for assessing sports skill because fatigue leads to more error, poor performance and judgement in subjects (Wilkins et al. 2004).

On the whole, there were no studies found in dynamic balance possible improvements towards soccer skill performances in soccer players, therefore more research on this field is required.

5.4 Problems Encountered During Study

The problems for this study are time of year data was collected, the true soccer skill and balance ability that the player has. The research participants were tested in the middle of the year which is end of their season, fatigue could have resulted in lower scores. Wilkins et al. (2004) stated that postural stability decreases acutely after isolated muscle fatigue and whole body fatigue. They demonstrated that group with fatigue protocoi scored significantly more total errors and subjects performed more poorly in the test.

The next problem is the true soccer skill or balance ability of the player is unknown, some of them may have better soccer skill or balance ability then others even before treatment was conducted or the soccer skill may not have been too much different

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between the two groups employed in this study. If the participants were recruited from two different teams such as national team and club team, then the soccer ability would have been much greater than the comparison group.

Finally, the nature of the soccer games probably enhances the existence of muscle imbalances. Over emphasis on one sided activities such as kicking may lead to dominance of one leg which may affected the LSPT and JMBT results.

5.5 Practical Application

This present study results serve several practical applications. Firstly, regular balance training can be beneficial and provide a wide range of benefits which make it an excellent thing to integrate into a regular athletic routine. Special balance exercises in training preparation are helpful for achieving better sports results. Understanding the profile of players could give coaches and physical trainers better working knowledge of this particular group of athletes. How athletes from different sports perform on balance is not well understood. It may be important to identify the level of dynamic balance that the athlete has because it is one of the greatest physical predictors of athletic success. Specific test may be used to determine athletes dynamic balance abilities. This information is useful where coaches or trainers may adjust training regimes to improve on sports skill.

Secondly, the findings of this study demonstrate that balance training programme can be applied in soccer players on a daily basis or at least 3 times per week according to the demands of the training period. The frequency and duration is differing but in majority of investigation in past studies the program is performed during the season for 5, 10,15 or 20 minutes per session.

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Last but not least, this study may be used to guide future exploration of dynamic balance and sport skills since performance of any sports skills requires some degree of balance

5.6 Summary

Many sports and physical activities require different levels of abilities and skills. The development of dynamic balance abilities plays a key role in most of them. The purpose of this study is to synthesize current knowledge in the area of balance ability and the effects on sports skill, balance training and highlight the findings and identify any future research needs. A number of studies have found that poor balance ability is significantly related to risk of injuries but there were no study measuring dynamic balance parameter possible improvements on sports skills especially in soccer player.

Balance is obviously influenced by a host of factors and relevant to sport performance. Soccer players perform a series of dynamic balance in the games; therefore the improvement on dynamic balance enables them to perform better in skills. Achieving excellent performance is possible only with sufficient development of dynamic balance abilities because movements or skill in any sport is realized mostly in unstable condition. Improvements on athletes balance are proven to achieve better in sport technique and skills (Vladimir, 2006).

A variety of balance test exists, therefore choose test that are reliable and considered by some to be valid. Practically, JMBT require minimal equipment, easy to run and practical in this present study. Meanwhile, McGregor et al. (2006) suggested that LSPT are reliable indicators of dribbling and passing skill in dynamic condition compared to other soccer skill test that assessing more on technique rather than skills.

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There is definitely a need for more-research focusing on dynamic balance in the sports skill setting. The results of this study propose that specific balance training is effective as part of the normal soccer training program in order to improve the proprioception and ability of the players. Given results in this study, it is highly recommended to implementation of dynamic balance training to improve ability on soccer skills

5.7 Conclusion

The results of this study indicated that there was a significant improvement in dynamic balance ability and soccer skill performances as the result of the four-week balance training programme. This present study proposed to include a sport specific balance training as a part of the normal soccer training programme in order to improve on sports skills. Definitely, more research on dynamic balance and soccer skill is needed to determine the effects of a balance training programme on dynamic balance and soccer skill performances. In conclusion, the four-week balance training programme is applicable to improve on dynamic balance and skills among soccer players.

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REFERENCES .

AN, A., Williams, C, Hulse, M., Strudwick, A., Reddin.J., Howarth.L, Eldred.J., Hirst,M.& McGregor, S. (2007) Reliability and validity of two tests of soccer skill. *Journal of Sports Science, 25,* 1461-1470.

Blackburn,T.,Guskiewicz,K.M.,Petschauer,M.A.&Prentice,W.E.(2000).Balance and joint stability the relative contribution of proprioception and muscular strength. *Journal of Sport Rehabilitation,*^ 5 - 328 .

Bressels, E., Yonker, C.J.,Kras, J. & Heath, M.E.(2007).Comparison of static and dynamic balance in female collegiate soccer, basketball and gymnastics athletes. *Journal of Athletic Training,42,42-* 46.

Bunc,V.,Baker, J.S., Tong, R.J, Robberts, E.& Hanford,M.(2004). The repeatability and criterion related validity of the 20 meter multistage fitness test as a predictor of maximal oxygen uptake in active young men *Journal of Sports Medicine and Physical fitness,* 47,337-331.

Chang, W.R.,Kapasi, Z,Daisley, S.& Leach, W.J.(2001). Tibial shaft fractures in football players. *Journal of Orthopaedic Surgery and Research,* 2,1 - 5 .

Chong , R.K., Ambrose, A., Carzoli, J, Hardison, L.& Jacobson,B.(2001). Source improvement in balance control after a training program for ankle proprioception. *Perceptual and motor skills,* 92,265-272.

Cumps, E.,Verhagen, E.& Meeusen,R.(2007) .Efficacy of a sports specific balance training programme on the incidence of ankle sprains in basketball. *Journal of Sports Science and Medicine,6,* 212 -219.

Daphne, S.M. (2005). The effect of the speed function on some technical elements in soccer. *Journal of Sports,23,* 1-6.

Davlin, D.C. (2004). Dynamic Balance in high level athletes. *Journal of Perceptual and Motor Skills,98,* 1171-1176.

Emery, A.C,Cassidy,D.J,Klassen,P.T,Rosychuk,J.R.& Rowe,H.B.(2005).Development of a clinical static and dynamic standing balance measurement tool appropriate for use in adoiescents.Jouma*/ of Physical Theraphy,85,502-5'\4.*

Gioftsidu, A.,Malliou,P,Pafis,G.Beneka,A.Godolias, G.,Maganaris,C.N.(2006).The effects of soccer training and timing of balance training on balance ability *Journal of European Applied Physiology, 96,* 659-664.

Guskiewicz, K.M.& Perrin, D.H.(1996). Research and clinical applications of assessing balance. *Journal of Sport Rehabilitation,* 5, 45 - 63.

Hobbs, C. (2008).Importance of balance training and stability to mastery sports skills. The sports digest, volume 16 number 3.United States.

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Hrysomallis, C.(2007).Relationship between ability , training and sports injury risk. *Journal of Sports medicine. 37 (6),* 547-556.

Lucy, H . & Hastad, O. (2007). Dynamic balance in former elite male athletes and in Community control subjects . *Journal of medicine & Science in Sports ,12 (2),* 111 -116.

Lucett, S.(2007) .Balance training for the athlete . *Journal of Sports Medicine* ,7,24-30.

Luxbacher, J.A.(2005). Soccer step to success. United Kingdom. Human Kinetics .

Magill, A.R. (2006).*Motor learning and control: concepts and application 7th edition.* New York: McGraw Hill.

Marieb, N. E. (2000).*Human anatomy andphysioiogy:5th* edrf/o/iNew York : Addison Wesley Longman.

MCyntyre, M.C.(2004). A comparison of the physiological profiles of elite gaelic Footballers, hurdlers and soccer player. *British Journal Sports Medicine,39,*437-439.

McGregor, S.J., Hulse, M. & Strudwick, A.(2007). The reliability and validity of two tests of soccer skill. *Journal of Sports Science, 26,* 1277 - 1273.

Miller, K.D.(2006).*Measurement by the physical educator.why and h*ow.New York: McGraw Hill.

Ostojic, S.M.(2003) .Characteristics of elite and nonelite soccer players correlate to success. *Journal of Sports Science and Medicine* ,2,34-35.

Pafis, G. Ispirdilis, I. & Godolias, G . (2006). Balance training for soccer injury prevention. *Journal of Sport Science and Medicine ,32,230* - 343.

Pafis,G.,Gioftsidou,P.,Malliou,A.,Beneka,I.,Ipsirlidis,I.&Godolias,G.(2005). Balance exercises reduce Lower extremity injuries in young soccer players. Journal *of Sport Science and Medicine 31,*172 -177.

Punakallio , A.(2005). Balance abilities of workers in physically demanding jobs with special reference to fire fighters of different ages. *Journal of Sports Science and Medicine,* 4,1-48.

Price, S.D.,Neilson,J.P.,Harland,R.A. & Jones,R.(2004).Measurement of out balance in hollow spheres using floatation dynamics: soccer ball application. *Journal of Mechanical Engineering Science,* 279,159-167.

Roth, E.A. , Miller, G.M.,Ricard,M.,Ritenour,D.&Chapman, LB.(2006).Comparisons of static and dynamic balance following training in aquatic and land environments. *Journal of Sport Rehabilitation, 15,* 299-311.

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Sato, K.& Butcher-Mokha. M.(2006). Relationship between ground reaction force and stability. Level of the lower extremity in runners. Proceedings of the Fifth Annual College of Education Research Conference : Section on Allied Health Professions. 1:40-44.Miami:Florida International University .

Sayers. (1998). *Soccer for beginner.* New York:McGraw Hill.

Strand, B. N., & Wilson, R. (1993). *Assessing sport skills.* Champaign, IL: Human Kinetics.

Tsigilis, N., Zachopoulou, E., & Mavridis, T.(2001). Evaluation of the specificity of selected dynamic balance tests. *Perceptual motor skills. 92,* 827-833.

Twist, P.(2001). *Balance training :Strength Ball Training-2nd Edition.New* York.Amazon.Com.

Vladimir, P. (2006).Special balance exercises and their positive influence for sport performance. *Journal of College Sports Sciences, 11,309* -311.

Williams, A.M.,Horn, R.R.& Hodges,N.J.(2007).Skill acquisition. *Science and Football Journal, 14,*198 - 2 0 2 .

Wilkins, J.C.,Valovich McLeod,T.C.,Perrin, D.H.& Gansdeders, B.M.(2004). Performance on the balance error scoring system decrease after fatigue . *Journal of Athletic Training,39,156-161*

Yaggie, J.& Cambell, B.(2006). Effects of balance training on selected skills. *Journal of Strength and Conditioning Research .20(2), All-*488

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APPENDICES

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APPENDIX 1

Informed Consent Form

The Effects of Balance Training on
Dynamic Balance and Soccer Skill Performances

Introduction

I,_____, have been asked to participate in this research study which has been explained to me and conducted by Siti Azilah Atan to fulfil the requirements for a master's thesis in Faculty of Sports Science and Recreation at Universiti Teknologi MARA .

Purpose of the Study

I understand that the purpose of this study is to assess the balance training on dynamic balance and soccer skill performances.

Description of Procedures

This study will be conducted at the Perbadanan Kemajuan Negeri Selangor Sports Centre

This informed consent form explains my rights as a research subject. I will be shown and voluntarily fill out an injury history and demographic questionnaire after my consent is obtained, which will be kept confidential.

If I am chosen for this study I will undergo a pre and post test measurement of my dynamic balance using the Johnson Modification of the Bass Test of Dynamic Balance and Loughborough Soccer Passing Test for soccer performances. The test will be conducted one week prior to and following the four-week exercise intervention

In Johnson Modification of the Bass Test of Dynamic Balance eleven pieces of tape are placed in the pattern as shown in appendix 1. Firstly the test performer will stands with the right foot placed on the starting mark. Second step, the performer will jump to the first tape mark and lands on the ball of the left foot and hold it for five seconds. The test continues to the other tape marks with alternating feet and attempting to hold steady position for five seconds. The ball of the foot must completely cover the tape. The test administrator should count aloud the seconds of each balance. In Loughborough Soccer Passing test, soccer skills will be measures are as follow: dribbling and passing.

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Dynamic Balance Training in Soccer Athletes

The four- week intervention for the balance training program will be conducted as follows. 1 will follow the program 3 times a week for an average of 20 minute sessions. The exercises involve such as the football tweak and jumps steps .

Risk and Discomforts

I understand that there are no known or expected risks from participating in this study. Mild muscle soreness or expected discomforts with performing the Johnson Modification of the Bass Test of Dynamic Balance , Loughborough Soccer Passing test and balance training

I understand that every precaution has been taken to prevent me from being injured in this study. If an adverse physical or psychological reaction were to occur during any point of the study, appropriate care or referral will be made available. Should any injury occur, I understand that Siti Azilah Atan will provide first aid and make any necessary medical referral.

I willingly consent to participate in this research.

Date: ( )

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APPENDIX 2

Demographic/Injury History Questionnaire

Name : _____

Age : _____

Gender : _____

Height : _____

Weight : _____

Tick on the appropriate box

1. Leg Dominance

☐ Left ☐ Right

2. Foot Size

☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

Others..... (Please State)

3. Highest Participation in Soccer Competition

☐ State

☐ National

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4. Have you had a lower extremity injury within the past six months that required the intervention of a medical or allied health care professional?

☐ YES ☐ NO

If yes, please explain.....

5. Have you had an upper extremity injury within the past six months that required the intervention of a medical or allied health care professional?

☐ YES ☐ NO

If yes, please explain.....

6. Have you had a head injury within the past six months that required the intervention of a medical or allied health care professional?

☐ YES ☐ NO

If yes, please explain.....

7. Have you had any balance training within the past six months?

☐ YES ☐ NO

If yes, please explain.....

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APPENDIX 3

Johnson Modification Dynamic Bass Test (JMBT) Layout

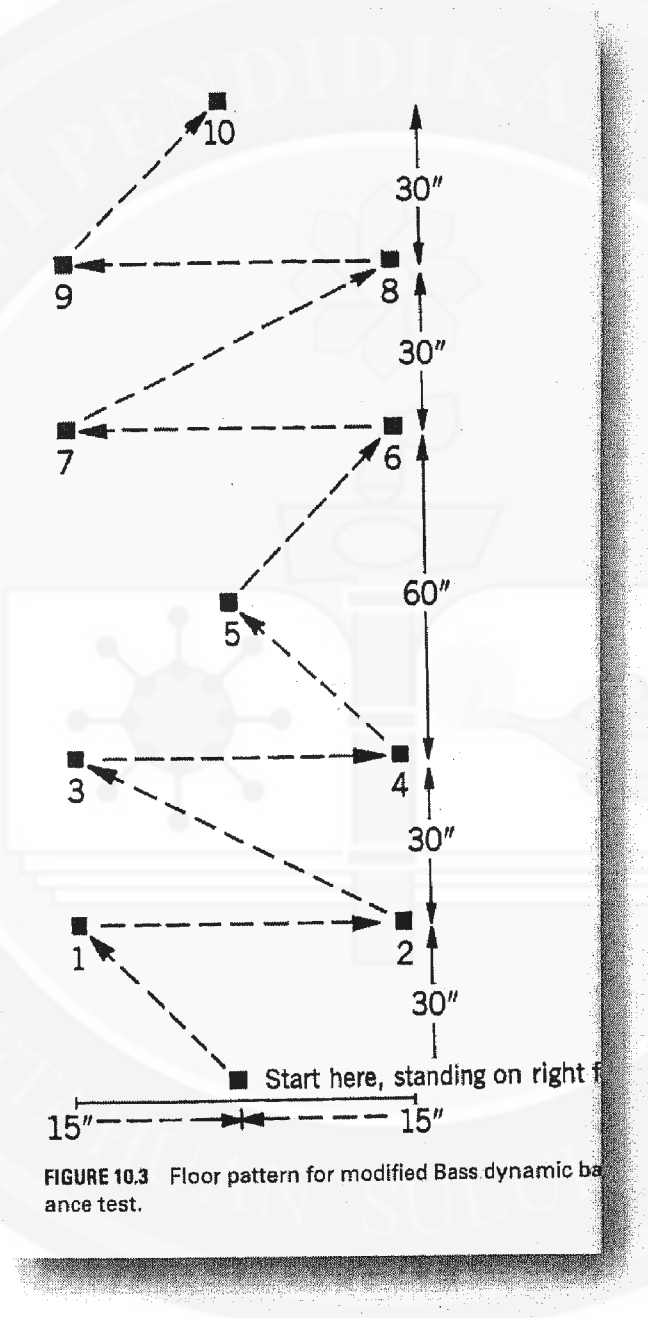


FIGURE 10.3 Floor pattern for modified Bass dynamic ba
ance test.

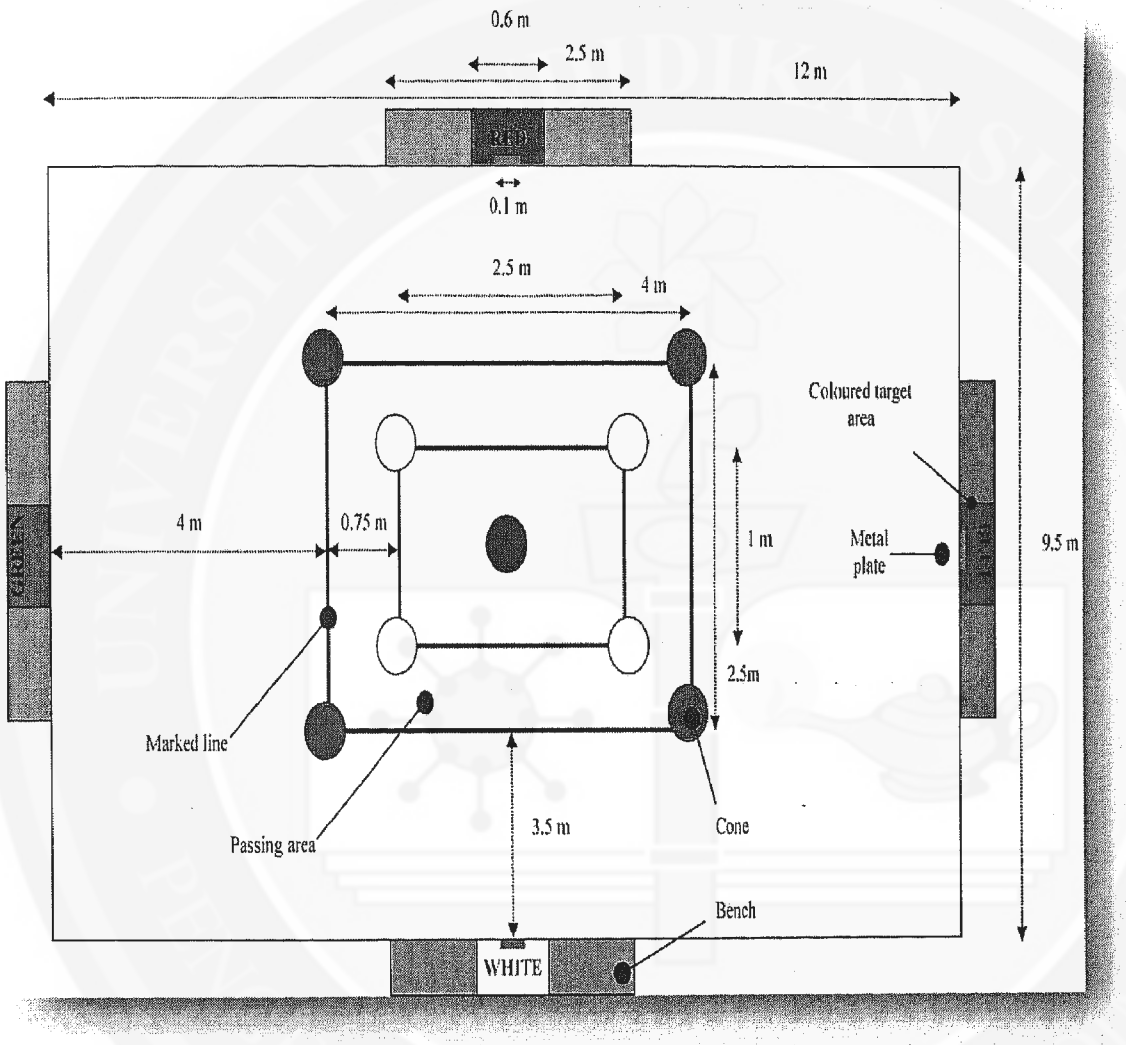
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APPENDIX 4

Loughborough Soccer Passing Test (LSPT) Layout



Adapted from

Ali,A.,Williams,C.,Hulse,M.Strudwick,A.,Reddin,J.,Howarth,L.,Eldred,J.,Hirst,M.&McGregor,S. (2007) Reliability and validity of two tests of soccer skill. Journal of sports science, 25, 1461 - 1470.

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APPENDIX 5

Balance Training Programme

WEEK 1

1. **Session 1 – Monday**
2.

i. Single leg Squat right (12 repetitions per set) 2 sets
ii. Single Leg Squat left (12 repetitions per set) 2 sets
iii. Body weight Squats (12 repetitions per set) 2 sets
iv. Static lunges left(10 repetitions per set) 2 sets
v. Static Lunges right(10 repetitions per set) 2 sets
vi. Alternate lunges (10 repetitions per set) 2 sets

2. Session 2 – Wednesday

i. Single Leg Squat left with medicine ball (10 repetitions per set) 2 sets
ii. Single Leg Squat right with medicine ball (10 repetitions per set) 2 sets
iii. Alternate Lunges (10 repetitions per set) 2 sets
iv. Alternate Lunges with medicine ball (10 repetitions per set) 2 sets

3. Session 3 – Friday

i. Alternate lunges with jump (12 repetitions per set) 2 sets
ii. Multidirectional Lunges (12 repetitions per set) 2 sets
iii. Jump Body weight Squats (12 repetitions per set) 2 sets
iv. Single leg lunges right (12 repetitions per set) 3 sets
v. Single leg lunges left (12 repetitions per set) 3 sets

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WEEK 2

1. Session 1 – Monday

i. Single leg hop right (10 repetitions per set) 2 sets
ii. Single leg hop left (10 repetitions per set) 2 sets
iii. Alternate hop (10 repetitions per set) 2 sets
iv. Single leg box hop up right (10 repetitions per set) 2 sets
v. Single leg box hop up right (10 repetitions per set) 2 sets

2. Session 2 – Wednesday

i. Alternate leg box hop-up (10 repetitions per set) 3 sets
ii. Star Hop right leg - 3 sets
iii. Star Hop left leg – 3 sets
iv. Hop leap (leap from mark to mark, alternating the landing foot, maintain a one foot static balance on each mark for 5 seconds) repeat three times
v. Jump steps (jump step forward from a standing start onto one foot , hold 3 seconds, then return to the starting point . repeat on the other side) repeat twice
vi. Repeat jump steps in all plane (sagittal , transverse , frontal) repeat twice

3. Session 3 – Friday

i. Jumps steps in all planes with
   a. Arms above the hand
   b. Hands reaching out to touch landing foot
   c. In the transverse plane rotate arms away from body when jumping out, then into your body when jumping back
   d. Arms driving in different directions as subjects jump step, one forwards , the other out to the side

   (All exercises performed in two repetitions)

ii. The tennis tweak (take a jump step forwards onto the right foot while taking a forehand volley. Repeat on the left foot with backhand volley. Repeat using clock face analogy. If left dominance , do the opposite

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WEEK 3

1. Session 1 – Monday

i. Alternate jump lunges (10 repetitions) 4 sets
ii. Alternate leg box hop-up (10 repetitions per set) 4 sets
iii. Star Hop right leg - 4 sets
iv. Star Hop left leg – 4 sets
v. The tennis tweak (take a jump step forwards onto the right foot while taking a forehand volley. Repeat on the left foot with backhand volley. Repeat using clock face analogy. If left handed , do the opposite)
vi. The football tweak .Apply the same principles as the tennis tweak .Jump stepping with one foot while a server feeds subjects volley to strike with the other foot.

(Repeat two times per exercise

2. Session 2 – Wednesday

i. Hop leap (leap from mark to mark, alternating the landing foot, maintain a one foot static balance on each mark for 5 seconds) repeat four times
ii. Jump steps (jump step forward from a standing start onto one foot , hold 3 seconds, then return to the starting point . repeat on the other side) repeat three times
iii. Repeat jump steps in all plane (sagittal , transverse , frontal) repeat three times

2. Session 3 – Friday

i. The football tweak .Apply the same principles as the tennis tweak .Jump stepping with one foot while a server feeds subjects volley to strike with the other foot.
(Repeat three times)

iii. Jumps steps in all planes with
   a. Arms above the hand
   b. Hands reaching out to touch landing foot
   c. In the transverse plane rotate arms away from body when jumping out, then into your body when jumping back

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d. Arms driving in different directions as subjects jump step, one forwards , the other out to the side

(All exercises performed in two repetitions

WEEK 4

1. Session 1 – Monday

i. Alternate lunges with jumps (10 repetitions) 4 sets
ii. Jump steps (jump step forward from a standing start onto one foot , hold 3 seconds, then return to the starting point . repeat on the other side) repeat four times
iii. Repeat jump steps in all plane (sagittal , transverse , frontal) repeat four times

2. Session 2 – Wednesday

i. Alternate leg box hop-up (10 repetitions per set) 4 sets
ii. The football tweak .Apply the same principles as the tennis tweak .Jump stepping with one foot while a server feeds subjects volley to strike with the other foot.
(Repeat four times)
iii. Hop leap (leap from mark to mark, alternating the landing foot, maintain a one foot static balance on each mark for 5 seconds) repeat four time.

3. Session 3 – Friday

i. The tennis tweak (take a jump step forwards onto the right foot while taking a forehand volley. Repeat on the left foot with backhand volley. Repeat using clock face analogy. If left dominant , do the opposite) – repeat 4 times
ii. Jumps steps in all planes with
    a. Arms above the hand
    b. Hands reaching out to touch landing foot
    c. In the transverse plane rotate arms away from body when jumping out, then into your body when jumping back
    d. Arms driving in different directions as subjects jump step, one forwards , the other out to the side (All exercises performed in two repetitions)

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APPENDIX 6

Data Collection Form for JMBT

Pre-Test Data Collection Sheet for the Johnson Modification of the Bass Test of Dynamic Balance(JMBT)

Name :.....

Age : .....

Gender :.....

Height : .....

Weight :.....

Dominant Lower Extremity: .....LEFT...../.....RIGHT.....

Score:

TAP/ MARK	TRIAL 1	PENALTY	TRIAL 2	PENALTY	TRIAL 3	PENALTY
Tape 1						
Tape 2						
Tape 3						
Tape 4						
Tape 5						
Tape 6						
Tape 7						
Tape 8						
Tape 9						
Tape 10						
TOTAL						
TOTAL MARKS AFTER PENALTY DEDUCTION	**...../100**		**...../100**		**...../100**	

SUM OF TOTAL SCORES: ...../100.....

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Post-Test Data Collection Sheet for the Johnson Modification of the Bass Test of Dynamic Balance (JMBT)

Name :.....

Age : .....

Gender :.....

Height : .....

Weight :.....

Dominant Lower Extremity: .....LEFT...../.....RIGHT.....

Score:

TAP/ MARK	TRIAL 1	PENALTY	TRIAL 2	PENALTY	TRIAL 3	PENALTY
Tape 1						
Tape 2						
Tape 3						
Tape 4						
Tape 5						
Tape 6						
Tape 7						
Tape 8						
Tape 9						
Tape 10						
TOTAL						
TOTAL MARKS AFTER PENALTY DEDUCTION	...../100		...../100		...../100	

SUM OF TOTAL SCORES: ...../100.....

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APPENDIX 7

Data Collection Form for LSPT

Pre-Test Data Collection Sheet for the Loughborough Soccer Passing Test (LSPT)

Name :.....

Age : .....

Gender :.....

Height : .....

Weight :.....

Dominant Lower Extremity: .....LEFT...../.....RIGHT.....

Score:

NO	SCORING	PENALTY	REMARKS
1.	5 second for missing the bench completely or passing the wrong bench		
2.	3 second for missing the target areaa		
3.	3second for handling the ball		
4.	2second for passing the ball from outside of the designated area		
5.	2second if the ball touched any cone		
6.	1 second for every second over the allocated 43s to complete the test		
7.	1 second deducted from the total time if ball hit the 10 m strip, middle of the target		
8.	Time completed		
	TOTAL		

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Post-Test Data Collection Sheet for the Loughborough Soccer Passing Test (LSPT)

Name :.....

Age : .....

Gender :.....

Height : .....

Weight :.....

Dominant Lower Extremity: .....LEFT...../.....RIGHT.....

Score:

NO	SCORING	PENALTY							REMARKS
1.	5 second for missing the bench completely or passing the wrong bench								
2.	3 second for missing the target areaa								
3.	3second for handling the ball								
4.	2second for passing the ball from outside of the designated area								
5.	2second if the ball touched any cone								
6.	1 second for every second over the allocated 43s to complete the test								
7.	1 second deducted from the total time if ball hit the 10 m strip, middle of the target								
8.	Time Completed								
	TOTAL								

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APPENDIX 8

Research Schedule

RESEARCH SCHEDULE
Date : 29th August 2009 Pilot Test i. Johnson Modification of the Bass Test of Dynamic Balance (JMBT) ii. Loughborough Soccer Passing Test (LSPT)
Date : 12th July 2009 Pre test iii. Johnson Modification of the Bass Test of Dynamic Balance (JMBT) iv. Loughborough Soccer Passing Test (LSPT) (Data on both test collected)
Date : 13th July – 9 august 2009 Intervention Program i. Week 1 – 13th – 19th July 2009 ii. Week 2 – 20th- 26th July 2009 iii. Week 3 –27th July – 2nd August 2009 iv. Week 4 –3rd – 9th August 2009
Date : 10th August 2009 Pre test i. Johnson Modification of the Bass Test of Dynamic Balance (JMBT) v. Loughborough Soccer Passing Test (LSPT) (Data on both test collected)

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Appendix 9

Balance Training Sources

1. Brown,L.E. & Ferrigno,V.A. (2005) . Training for speed , agility and quickness.United States .Human Kinetics .
2. Brown, L.E.,Ferrigno,V.A. & Santana,C.J. (2000) . Training for speed , agility and quickness . United States.Human Kinetics
3. Cumps,E.,Verhagen,E.&Meeusen,R.(2007) .Efficacy of a sports specific balance training programme on the incidence of ankle sprains in basketball.Journal of sports science and medicine ,6, 212 -219
4. Tyson, A. & Ben, C. (2004). Jumpmetrics. United States .Human Kinetics.
5. Luxbatcher, J.A.(2005) . Soccer step to success. United Kingdom.Human Kinetics.

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