CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Football games are one of the most popular games and team sports worldwide. Football players’ kick is the crucial moment and action during the games and teams with more kicks on the target has better chance to win the game. With this, improvements of kicking technique have to be taken care of. A good kicking technique is essential for a football player. Therefore, the understanding of biomechanical loading of one of the kicking technique which is instep kick is particularly important for their training process (Manolopoulos et al., 2006).

Instep kick is the most powerful kick in football. It is known that with no limitations on the run up the instep kick is the optimal kick in terms of ball velocity (Lees, 1998) and precise (Peitersen, 1998). It is a fact that the instep kick is an open kinetic link movement that has biomechanical advantages with pre-tension in swing phase that created by run up. Basically, instep is on the top of foot where the shoelaces are tied. For performing instep kick, supporting leg is placed at the side and slightly behind the ball. The kicking leg is first taken backward swing with flexed knee. Then in following forward swing, kicking leg should be carried out in whip-like manner which is forward rotation begin with hip, followed by rotation of knee and ankle. Thigh should be slow down before ball contact and the speed of ankle and toe is increase dramatically. Timely control of kicking leg is vital for quality of instep kick (Shan G. et al., 2011). Kicking leg has three link kinetic chains which are thigh, shank and foot. Hip, knee and ankle is the parts that is usually been measured for biomechanical study for soccer.
Biomechanics is the study of living things, plant, animal, human biomechanics that investigate on human being and exercise and sports biomechanics include human that is involving in exercise and sports (Luhtanen, 1988). Biomechanical evaluations consist in measuring kinematics, kinetics and muscular activity of human movement (Cerulli G. et al., 2004). Kinematics analyzes the movement of the body and its parts. Kinetics is analysis of forces that produce motion while the muscular activity provides information about the action of the muscles that produce the necessary strength to create motion. The combination of these three is essential to identify functional alterations. Biomechanical loading in kicking for football games is important for guiding a training process.

The key success of any kick is football is actually the placement of the supporting foot means the non kicking foot. If it is improperly positioned relative to the ball, the resultant kick will be bad. However, there are actually various factors that contributed for a success of instep kick. It is depends on the distance of the kick from the goal, the type of the kick used, the air resistance and the technique of main kick which best described from biomechanical analysis. There are others factors such as training, equipment involved, injuries, role of the arm and supporting leg, conservation of linear momentum during collision, velocity of the foot, speed of the ball, accuracy of kicking, length, speed and angle involved, hip linear motion, dominant limb or preferred leg, age, position of players in the game and fatigue.

This study on double instep kick will focus on Malaysian footballer with or without knee pad that will seek for optimal variables that will contribute to succeed instep kick performance. With this study, perhaps the application of biomechanical principles to sport can improve the understanding of movement mechanisms, assess and improve performance and provide knowledge to prevent injuries.

1.2 BACKGROUND OF THE STUDY

Biomechanics is the study of living things, plant, animal, human biomechanics that investigate on human being and exercise and sports biomechanics include human that is involving in exercise and sports (Luhtanen, 1988). It is
important in football games to identify and investigate their kicking actions. It may contribute to increase their performance skills and biomechanics study is usually guidance in their training process. Biomechanics can be used in any sports but for this study, it will focus on success instep kicking techniques.

Anthropometry is the measurement of human individual. It is used for identification for purpose of understanding human physical variation. Statistical data is important in ergonomics where it is about distribution of the body dimensions in the population and it is used to optimize products. For sure there are changes in lifestyle or nutrition and it leads to changes in distribution of body dimension and it requires regular updating of anthropometric data collections.

1.3 PROBLEM STATEMENT

Biomechanics research on football games and instep kick has been studied by many of the researchers before. All of the studies relate to many aspects or factors that may contribute to successful kicking actions. Some of the researches are regarding number of trial that is necessary to achieve performance stability during soccer instep kicking, biomechanical responses of instep kick between different positions, biomechanics analysis for right leg instep kick, effects of leg muscle fatigue on instep soccer kick and many more. As been seen, instep kick is mostly chosen as research for study. Therefore, biomechanics loading for double instep kick is chosen for this study. However, it is more to comparison of using knee pad or without knee pad while performing double instep kick. The variables from collected data will be analyzed to see the correlation towards the performance between using knee pad or without knee pad in this study.