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EFFECTS OF ELECTROMYOSTIMULATION AND RESISTANCE TRAINING ON BATTING VELOCITY IN SOFTBALL

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ABSTRACT

Having a fast batting velocity is an important characteristic for all softball players. Previously, traditional resistance training and dry swing training were commonly used by coaches to develop strength and batting velocity. Recently, whole-body electromyostimulation (WB-EMS) has been employed as an alternative training method in improving strength. However, it is not fully explore in improving sport specific movement such as batting velocity. Therefore, this study aimed to investigate the effectiveness of eight weeks of WB-EMS training on strength and batting velocity among female collegiate softball players. Four different training modes namely dry swing and resistance training (DS&RT), dry swing and whole-body electromyostimulation (DS&EMS), dry swing concurrent with whole-body electromyostimulation (DSEMS) and dry swing only (DS) were conducted in this study. Results after eight weeks showed that all of the training groups improved in upper body strength (DS&RT: 28.71%, DS&EMS: 9.90%, DSEMS: 6.74%), lower body strength (DS&RT: 19.51%, DSEMS: 14.15%, DS&EMS: 9.44%), and torso rotational strength (DS&RT: 29.15%, DSEMS: 27.60%, DS&EMS: 20.22%). However, dry swing group showed only an improvement in torso rotational strength (9.37%). Having a greater strength helps to generate fast batting velocity and this study demonstrated that dry swing and traditional resistance training produced greater improvement in muscular strength compared to WB-EMS training. On the other hand, dry swing concurrent with whole-body electromyostimulation generated fastest batting velocity (10.5%) compared to DS&RT (8.43%), DS&EMS (3.67%), and DS (0.3%) group. This indicates that concurrent training was able to improved sport specific movement. Furthermore, this DSEMS training only takes about 20-25 minutes of training time per session; hence, it is able to serve as an alternative training method for coaches who have time constraint in preparing their athletes specifically in strength and batting velocity. In conclusion, this study suggests that for coaches who want to improve their players' strength, traditional resistance training should be consider to be applied in their training program. However, for coaches who focus on improving strength and direct to sport specific movement, dry swing concurrent with whole-body electromyostimulation should be include in training program. Since this study measured on the effectiveness of WB-EMS on strength and batting velocity, in future, it is recommended to measure the effectiveness of WB-EMS on other physical and sport's specific movements.

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CHAPTER ONE
INTRODUCTION

1.1   Research Background

Softball can be regarded as one of the most popular recreational and competitive sports played commonly by women and men around the world. According to an annual report produced by the Sports & Fitness Industry Association (SFIA) in year 2016, there were nearly 25 million softball and baseball participants in the United States for year 2015. Furthermore, these two sports topped the list as the nation's most played team sport in year 2016. Malaysia is also no exception where both softball and baseball teams are actively participating in Local and International competitions. However, Malaysian softball team especially the women team's capabilities is still far away compared to advanced country such as American's women team. This is because; their training is more advanced, systematic, and seasonally. Although women's softball team actively participating at International competitions, their result is not favourable. This is because their training is not systematic and seasonally. Additionally, the athletes and coaches only gather and train when there is a competition to play. This lead to lack of training and not well conditioned before competition. On top of it, this sport requires complex skills such as running, throwing, catching, pitching, and batting. All of these skills and technique are compulsory to be learned and mastered by all players to win the competition (Milanovich & Nesbit, 2014).

Among all of the skills include in softball, batting is known as the fundamental skill. This is because, it promotes a significant result in the offensive tactics during game played (Walsh, 2014). Identical to other racquet or bat sports, in the course of batting; the objective of a player is to execute and deliver the maximum amount of energy as they can in order to swing and contact the ball. When the player able to deliver the maximum amount of energy to the contact point (where the bat meet the ball), the energy was then transferred to the ball and accelerate it to a high velocity (Adair, 2002). This will provide advantages to the player in gaining score for the team and, subsequently winning the game.

Having a perfect swing mechanic is one of the most important factors to