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Effects of Imagery and Video Modelling on Self-Efficacy during Resistance Exercise

Thariq Khan Azizuddin Khan, Nor Fazila Abd Malek, Asmadi Ishak, Nur Haziyanti Mohamad Khalid & Ali Md Nadzalan

Abstract*: The purpose of this study is to examine the effects of audio imagery with video modelling on participants' self-efficacy during resistance exercise. Forty five individuals volunteered as research participant and were divided homogenously into imagery with modelling end instruction (EIM) or initial instruction (IIM) groups and a modelling only (M) as control group. During the pre-test all participants employed self-efficacy (SE) of lunges exercise. All participants were provided with the interventions (EIM, IIM, & M) during 10 minutes rest before the first post-test which, all measurements were conducted to look at the acute effects of interventions employed. Participants' android phones were downloaded with specific intervention according to their group and they were advised to employ the intervention once a day for seven days. The second post-test was conducted consist of all measurements after seven days of intervention duration. For self-efficacy, significant results were recorded on pre-test and post-test within participants in EIM and IIM ($p < 0.05$), moreover, results for post-test comparing data between groups indicates significant between EIM and M groups, IIM and M groups ($p < 0.05$). No significant different results found comparing EIM with IIM groups. Results from this study indicate that there are psychological performances improvement among participant who employed imagery and modelling comparing to modelling alone.

***Index Terms*: imagery, video modelling, self-efficacy**

I. INTRODUCTION

Resistance exercise has been shown to be one of the most effective training methods in improving physical abilities especially muscular strength [1, 2]. Various psychological methods have been introduced to enhance the effectiveness during resistance training such as self-talk and focus attention [3-5].

One of the most used psychological methods in sport setting is imagery.

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***** Correspondence Author
Thariq Khan Azizuddin Khan*, Faculty of Sports Science and Coaching, Sultan Idris Education University, Malaysia.
Nor Fazila Abd Malek, Faculty of Sports Science and Coaching, Sultan Idris Education University, Malaysia.
Asmadi Ishak, Faculty of Sports Science and Coaching, Sultan Idris Education University, Malaysia.
Nur Haziyanti Mohamad Khalid, Faculty of Sports Science and Coaching, Sultan Idris Education University, Malaysia.
Ali Md Nadzalan, Faculty of Sports Science and Coaching, Sultan Idris Education University, Malaysia.

Despite of its effectiveness in improving sport/exercise performance [6-12], not much studies has investigated the effects of imagery during resistance training. Imagery has been showed to provide positive psychological outcome in anxiety [13], confidence [14, 15] and self-efficacy [16]. Recently, studies have also shown that imagery interventions can benefit self-efficacy during injury rehabilitation [17]. In the field of motor learning and control, some past studies were undertaken to see the role of imagery in the fine and gross motor skills performance. Kuan, Morris, Kueh, and Terry [18] proved that listening to relaxing music during imagery was associated with the largest performance gain in fine motor skills among darters. In addition, imagery training can also be helpfully used as a therapy to improve fine and gross motor skills in children with developmental coordination disorder (DCD) [19, 20].

Recently, the use of video modelling in learning a motor skills and performance has received attention among researchers [21]. Video modelling was defined as the action when a person is watching another person demonstrating a targeted desire skill or behaviour on an electronic screen such as tablet, TV, DVD, projector screen and computer. Next, the skill or behaviour will be performed by the viewer [22]. Tablets/iPads or Android phones are ideal modes of using technology for Physical activity due to their portability as well as their ability to record and replay videos. The objectives of this study is to examine the effects of imagery and video modelling interventions on self-efficacy during resistance exercise. As has been shown in previous researches, due to the important of lunge in sport/daily movement, studies on lunge keep increasing [23-25]. Thus, lunge was chosen as the exercise to be implemented in this study.

II. METHODOLOGY

A. Research design

A pre-test, single intervention, post-test 1, intervention seven days) and post-test 2, design was employed in this study.

B. Participants

Forty five male and female first year undergraduate students from a public university with no/minimum experience in resistance training and psychology skill training ages from 19 to 23 years old were recruited in this study based on volunteerism basis. They we divided into three groups; Imagery using Modelling groups encompass ending instruction (EIM), initial instruction (IIM) and modelling only (M) as control group.

C. Equipment

Any android phone brand with the screen size range between 5.1 cm x 7.6 cm were used as portable device to deliver imagery training in this study.

The imagery audio instruction and video modelling were downloaded into participants' android phone. The lunges performance were recorded from right angles using a JVC digital video recorder.

D. Demographic form

A brief demographic form was design to ascertain the participants' information and background (e.g. gender, age, height, psychological training experience, level and duration of participation in sport).

E. Self-efficacy

The self-efficacy (SE) measure were developed specifically for this study, using guidelines presented by Bandura [26] based on his original procedures for developing a task-specific measure of self-efficacy of Lunges. In this study participants self-efficacy on performing correct 10 repetition of lunges using bar with no weight plate were measures during pre-test and post-test 2.

F. Imagery ability measure

The Sports Imagery Ability Measurement (SIAM [27]) is a 48-item self-report questionnaire that examines the experience of 60 seconds of each of the four sport-related scenes on 12 subscales. In this study four sub-scales encompasses visual, control, vividness and ease were measures as these are the elements applied during the intervention. Imagery ability measures were conducted during the pre-test and post-test 2.

III. RESULTS

For lunges self-efficacy results from pre-test and post-test analysis indicates that there are increments within participant for all three groups , however significant results only detected in EIM and IIM participants (P= < 0.05). There are no significant results shown during post-test analysis comparing between three groups for self-efficacy measure.

Table 1: Lunges Self-efficacy

Group	Pre-Test		Post-Test		*S**
	M	SD	M	SD	
EIM	88.75	6.98	92.50	5.99	0.01*
IIM	73.23	16.65	89.00	7.65	0.05*
M	73.75	11.01	81.93	10.85	0.15

IV. DISCUSSIONS

Previous research has found self-efficacy significantly have greater influence to performance in resistance training, study by Gilson and Curnock, [28] revealed that self-efficacy was positively, and significantly, related to the current effort that athletes exerted in strength training sessions. In this study imagery training using modelling was compared with modelling alone intervention, the results indicates that there are more beneficial to employ imagery training with modelling compared to modeling alone among beginners participant in self efficacy during resistance exercise. These findings are in line with study by Wright and Smith [29] who found that superior strength gains following a video-supplemented PETTLEP imagery program compared to imagery without video modelling.

Other than that, the result of this study also support finding from Buck, Hutchinson, Winter and Thompson [30], in that study researchers have found that imagery training with video modelling significantly increase self-efficacy and showed greater 3RM improvement in front squat exercise. This is probably because video modelling with imagery can help to improve imagery ability for those who have difficulty in generating, maintaining, and controlling mental images especially among novice due to their lack of specific motor skills experience, particularly as neuroimaging studies by Debarnot, Sperduti, Di Rienzo and Guillot [31] have shown that the neural networks activated by mental imagery differ between novices and experts. According to Weinberg [32] imagery will be more effective to improve performance for athletes who are able to generate clear images, compared to athletes with poor imagery ability. So that, video modelling with combination of imagery may, therefore, be an effective method to improve imagery ability characteristics, whereby repeated exposures to a video model may facilitate ease of image generation [33].

Moreover, in this study different instruction procedure of employing imagery with video modelling was also investigated. Results from this study indicates that imagery instruction at the end or beginning of video modelling will provides equal effects on weight training performance and psychological measures (self-efficacy) imagery abilities.

V. CONCLUSIONS

In conclusion, this study has proved that imagery with modeling and instruction very helpful to improve self efficacy during resistance exercise among novice participant. Hence, coach or strength and conditioning practitioner should be considered to used mental imagery with modelling as a part of strength and conditioning programs.

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