

The Relationship between Self- Efficacy and Push – Ups Performance among Male Gym Members after 12 Weeks of Joining: A Pilot Study

Mazlan Ismail

Faculty of Sports Science and Recreation, Universiti Teknologi MARA Cawangan Negeri Sembilan, Kampus Seremban 70300, Seremban Negeri Sembilan Malaysia

ABSTRACT

The main objective of this study is to examine the relationship between self-efficacy of gym members and muscular endurance performance, measured from a push-up test. Data were collected from 70 male participants aged 18–25 years ($M = 20.87$, $SD = 2.15$). Prior to the push-up task, the participants were asked to rate the push-up self-efficacy scale, and they then performed the push-ups test using a “malan” detector. The participants were asked to do as many push-ups as possible in 1 min. Pearson correlation showed a positive significant relationship in that members who increased in self-efficacy also increased their push-up scores. This study concludes that the self-efficacy scale used for the specific exercise tasks (push-up) is a good instrument to assess a person’s performance in an exercise program. The findings can inform gym trainers on effective means of providing motivational support for non-members of members who seldom visit the gym. Gym trainers can also benefit from the results in dealing with potential new members during free trial. The ability of gym trainers to influence new members in undertaking a comfortable and beneficial regime can increase the likelihood of members’ adhering to the programme.

Keywords: Exercise, ‘Malan’ push – ups detector, muscular endurance, self- efficacy

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E-mail address:

mazlan.healthygeneration@gmail.com

INTRODUCTION

According to the social cognitive theory, a person with self-efficacy believes that he or she is able to perform any task at hand (Bandura, 1997). This trait is thought to be influenced by four factors: vicarious experience, mastery experience, verbal

persuasion, and somatic and emotional state (Bandura, 1997). The social cognitive theory also suggests that people with self-efficacy will partake in activities that they are good at, and *vice versa*. These people believe they can accomplish a difficult task that they perceive as a challenge to be mastered rather than a threat to be avoided (Hayden, 2014). The mastering of certain skills and the improvement of previous performance will generally elevate their goals and level of self-efficacy (Bandura, 1997). Self-efficacy also helps to increase the stages in skills development process as one masters a skill of higher level (Marcus, Selby, Niaura, & Rossi, 1992). For example, athletes who easily win a game become complacent compared to those who have higher self-efficacy and goals to win a more challenging game (Bandura, 1997).

In a physical exercise, efficacy information is obtained from the physiological state and fitness level of a person (Feltz & Lirgg, 2001). For example, individuals differ by their level of endurance, pain, fitness, strength, fatigue and the feeling of self-doubt and fear toward a given exercise regime. Participants who change their belief on how they can execute an exercise successfully tend to stick to their exercise regime (Annesi, Unruh, & Whitaker, 2007) and eventually improve their mental and physical health. As found by McAuley (1992), body composition and self-efficacy had a negative relationship during the early stage of a 5-month exercise program. In the study, the participants' exercise behaviors were measured in

week 3, week 12, and week 20, and self-efficacy was found to be a strong predictor of exercise adherence after week 12. The consistent continuations up to week 20 were seen in participant's exercise attendance and intensity at week 12. These findings clearly support the self-efficacy theory which denotes the mastery of skills helps to increase the self-efficacy of participants.

Nevertheless, most of the previous studies have focused on athletes' self-efficacy toward physical activities (Feltz, & Lirgg, 2001), and little research has been done to study non-exercisers who just joined a gym (Opperman & Strydom, 2012; Oberg, 2007). In one study, Mihalko and McAuley (1996), found that the feelings of self-efficacy increased after exercise among middle-aged, non-exerciser participants. Another study by Feltz and Lirgg (2001) also involved participants who were committed and experienced in exercises (Feltz & Lirgg, 2001); however, the study sought to identify only the relationship between self-efficacy levels of new gym members and exercise performance that were at twelfth week committing into exercises. The findings of the study nevertheless will be able to change the exercise behavior of new gym members and increase their adherence to a gym regime.

METHODS

Sample and Participant Selection

Seventy male participants aged 18–25 years ($M = 20.87$, $SD = 2.15$) participated in the current study. They were 12-weeks (trial pass) gym members who came to the gym

twice per week and were not attached with any physical trainer.

Assessments and Measures

The guideline of developing self-efficacy scale related to physical activity (Bandura, 1997) was used in this study. The present study followed the norms for a push-up test as recommended in a previous study (Miller, 2002). The participants performed a 1-minute push-up test by using a new tool called the “malan” push-up detector to detect the accuracy of push-up performance, such as the placement of hands and the way of counting the number of complete push-up.

Push-up self-efficacy scale. Self-efficacy is a task or a judgment about what a person thinks he or she can do, and not the skills he or she has (Mazlan, 2015; Moritz, Feltz, Fahrback, & Mack, 2000). However, a self-efficacy scale used to measure a particular task cannot be used for another task. For the present study, the participants' self-efficacy in performing a push-up test needed to be assessed yet no scale is available to measure this specific task. Following Bandura's (2006) recommendation, this study then developed a new push-up self-efficacy scale that was task-specific and hierarchically arranged to represent increasing levels of complexity, concordant with the task (Cumming, Nordin, Horton, & Reynolds, 2006; Mazlan, 2015; Moritz, Feltz, Fahrback, & Mack, 2000). The measures started with phrases such as *Rate your confidence that you believe you can get how many time... in 1-min*

push-ups task. The response items include *I believe I can get six times in 1-min*, and *I believe I can get 12 times in 1-min*, to list a few. The participants were then asked to rate the strength of their confidence at 1-min push-ups, using a 100-point scale that includes, among others, a point of 0 (cannot do at all), 50 (moderate can do), and 100 (highly certain can do). The homogeneity of items for this scale was unnecessary because the scale was a hierarchical scale (Feltz, Short, & Sullivan, 2008). However, the internal consistency was compulsory for this scale (Bandura, 2001) and thus Cronbach alpha coefficients were measured, resulting in a self-efficacy scale of 0.92.

1-Minute push-up test. Muscular strength and muscular endurance were the important health-related elements for the physical activity. Muscular endurance is defined as individual ability to perform repeatedly with a sub-maximum resistance over the time given. Muscular endurance also avoids undue fatigue from workload and other daily routines, and thus results in greater success and pleasure in physical and leisure activities (Bompa & Buzzichelli, 2010).

A push-up exercise is a great way to build upper body strength and endurance. The push-up test is acceptable fitness test used by trainers, coaches, and athletes to test for upper body strength and endurance (McManis, Baumgartner, & Wuest, 2000).

In this study, the 1-min push-up test or 60-s push-up test is a standardized full-level push-up performed with thumbs at shoulder width. The lifter needed to keep

his or her body straight from head to feet (male). One previous study had used a 90° push-up test to examine the muscular strength and endurance for the upper part of body (Hashim, 2012) and found that compared male students, compared to female students, recorded higher validity values by performing the test. The present study, however, required the participants (male) to lower their body until their chin touched the buzzer (the “malan” push-up detector), which was placed at the floor below the lifter’s chin (see figure 1).

The “malan” push-up detector used in this study was a 90° push-up detector that consists of a support device with four suction cups underneath the platform base, which served to prevent movement of the invention during the test. The user engagement devices included audible and visual signaling (lighting) devices, both of which had user contacting elements. The contacting elements registered when the participant’s chin touched the buzzer.

Procedure

For the initial health and medical assessments, the participants were asked to complete Physical Activity Readiness-Questionnaire (PAR-Q) (American College of Sports Medicine [ACSM], 2014). The participants took approximately 10 min to fill up the PAR-Q and self-efficacy scales. Subsequently, they performed the push-up test by using the “malan” push-up detector and were asked to do as many push-ups as possible in 1 min.



Figure 1. Position of the body until the chin touches the buzzer.

RESULTS AND DISCUSSION

The relationship between self-efficacy and 1-min push-up performance among the male gym members (12 weeks trial) was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity.

Findings from Table 1 indicate no correlation between the two variables ($r = 0.40, n = 70, p >0.05$). This result thus suggests a positive correlation between self-efficacy and 1-minute push-up performance, with high level of self-efficacy associated with higher level of 1-min push up.

Table 1

Pearson correlation between self-efficacy and 1-min push-up performance among 12-weeks Male Gym members (n = 70).

Variables	1	2
Self-efficacy	-	
1-minute push-ups	.01	-

CONCLUSIONS

The present study showed significant positive associations between self-efficacy and 1-min push-up performance among the 12-weeks male gym members. This finding supports the previous findings that demonstrated that the increase of push-up performance following the increase of a person's levels of self-efficacy (Moritz et al., 2000). Self-efficacy was also found in Kane, Marks, MZaccaro and Blair (1996) to be a stronger predictor to performance and a factor gave a positive impact toward task performance. Kane et al. (1996) specifically found that majority of the participants were ready and could perform beyond their expectation.

The current findings also attest that an exercise program is influenced by the self-efficacy of the participants (Sallis et al., 1989), and that exercise is also a cause of self-efficacy (McAuley, Courneya, & Lettunich, 1991). The findings of this study open a discussion among gym trainers if the members need fully motivational support and encouragement to exercise particularly for those who least come to the gym. Furthermore, this is also beneficial to the gym trainers who may be dealing with a potential new member during free trial. The ability of gym trainers to encourage new members to follow a comfortable and beneficial regime can increase the likelihood of gym members to adhere to a regime.

However, the present study is not without limitations. The significant relationships among the variables as noted from the results were probably influenced

by an uncontrollable factor such as the daily activities of the participants. The self-reported data also cannot be independently verified and are likely to contain potential sources of bias. As supported by previous studies, self-efficacy increased during moderate and after exercise routine (Treasure & Newbery, 1998). The amount of suggested exercises in accordance with the principle of FITT (frequency, intensity, time and type) needs to be given further attention (Oberg, 2007). As a result, the self-efficacy theory can be applied to help individuals cope with negative emotions due to not achieving expected goals or targets (Brown, Malouff & Schutte, 2005). Future studies that address the limitations of the current study are warranted given the potential positive psychological impact of task physical activity. Possible avenue is to explore the characteristics of physical activity that can best able to improve or promote task specific self-efficacy as a way to better predict positive affect.

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