USING EXERCISE TO INCREASE SELF-EFFICACY AND IMPROVE HEALTH BEHAVIORS

By

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AND IMPROVE HEALTH BEHAVIORS

Abstract

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Self-efficacy is the belief and conviction that one can perform a given activity (Caruso, 1992). Self-efficacy has long been considered to influence whether someone engages in, and adheres to an exercise program. This review of literature looked at the effects of exercise on self-efficacy and the relationship of self-efficacy to health behaviors. The literature review suggests that exercise does increase an individual's self-efficacy and that those individuals with higher self-efficacy are more likely to be successful at health behaviors such as weight control, stress management, nutritional compliance, smoking cessation, and exercise adherence.

The goal of primary care providers is to help patients become healthier and to decrease their morbidity and mortality, which is accomplished primarily through improved health behaviors. Practitioners have the opportunity to promote optimal levels of self-efficacy for patients. By helping an individual to increase their self-efficacy, practitioners may be more successful in mediating positive health behavior changes.

In order to promote exercise and positive health behaviors practitioners need to provide guidance to their patients based on their self-efficacy level. Once an accurate self-efficacy assessment is made an appropriate exercise prescription can be given to
specifically suit the patient. A self-efficacy scale and corresponding exercise prescription is provided in this paper.

Further research is needed to compare the effect of varying exercise intensities and durations on self-efficacy. Also more studies are necessary which examine the effects of different types of exercises, i.e. aerobic exercise vs. weight training, on self-efficacy. Lastly, there is a need to examine whether exercise programs which incorporate self-efficacy manipulation improve health behavior change.
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INTRODUCTION

Can exercise be used to increase an individual’s self-efficacy and therefore improve health behaviors? Exercise and physical activity have demonstrated a wide range of effects on a host of physical conditions including coronary artery disease, obesity, cancers, and overall mortality (Blair et al., 1989; Bouchard, Shepard, Stephens, Sutton, & McPherson, 1990). Exercise may have benefits beyond those due directly to improved physical fitness. This paper will review the literature regarding the impact of exercise on an individual’s self-efficacy. It will also examine the relationship between self-efficacy and health behaviors.

Self-efficacy is the belief and conviction that one can perform a given activity (Caruso & Gill, 1992). Bandura (1977), who is considered a leader in the notion of self-efficacy, believes that self-efficacy determines whether one attempts to perform a given task, how persistent one is when difficulties are encountered, and ultimately how successful one is in performing the task. Someone with a high self-efficacy is generally healthier because they can achieve what they set out to accomplish, they are more effective, and generally more successful than those with a low self-efficacy (Bandura 1977, 1986). If a person’s self-efficacy can be improved he or she may be more confident, competent, and successful in today’s society. A number of studies suggest that exercise is an effective means for increasing self-efficacy.

Self-efficacy is an important mediator of a broad array of health behaviors (Bandura, 1986; McAuley & Courneye, 1992; O’Leary, 1985; Strecher, DeVellis, Becker, & Rosenstock, 1986). Research findings that support the importance of individual behaviors in decreasing the risk of morbidity and mortality, suggest that efforts to increase self-efficacy may improve health behaviors (Conn, 1998). Practitioners may find more success with changing their patients habits by focusing on increasing a patient’s self-efficacy, which could result in significant health behavior changes, rather than elaborating on the potential benefits or harms of specific health behaviors.
SELF-EFFICACY AND HEALTH BEHAVIORS

Certain health behaviors are associated with a healthy lifestyle including a healthful eating pattern, regular exercise program, and weight control. Upon reviewing the literature regarding self-efficacy and health behaviors the importance of this relationship was confirmed. Enhanced self-efficacy has a positive influence on health behaviors.

Adherence To Exercise Behavior

In the typical supervised exercise setting, about 50% of participants will drop out of the exercise program within six months to a year (Dishman, 1988). Population estimates indicate that 41-51% of adults between the ages of 18-65 remain sedentary (Stephens, Jacobs, & White 1985; Powel, Spain, Christenson, & Mollencamp 1986). Only 20% of Americans exercise regularly and intensely enough to meet current guidelines for fitness or reduced risk for several chronic diseases and premature death (Stephens, 1985; Powell, 1986). Lifestyle-related diseases are most frequently related to an individual’s behavior and can be minimized by particular behavior changes (Berarducci & Lengacher, 1998).

Exercise has been shown to decrease morbidity and mortality. Sallis, et al (1986), Dishman (1988), and Fontaine & Shaw (1995) found that adoption of and adherence to exercise was determined by self-efficacy. They established that higher self-efficacy leads to greater adherence to exercise. Garcia & King (1991) showed that the level of self-efficacy correlated with whether exercise was maintained beyond program involvement. Therefore, measures to enhance self-efficacy are likely to lead to greater exercise adherence, an essential health behavior.

Stress Management Behavior

Being able to control one’s tension, anxiety, and stress are very important health behaviors because chronic stress negatively affects physiological homeostasis. Stress has been associated with ailments including stomach upsets or ulcers, decreased immune system function, headaches, arthritis,
colitis, diarrhea, asthma, cardiac dysrhythmias, sexual problems, muscle tension, and cancer (Clark, 1996). In several studies, enhanced self-efficacy was found to decrease anxiety, tension, negative affect, and stress response while there was an increase in positive mood (Toshihiko, Don, Zaichkowsky, & Delizonna, 1997; Stewart, Kelemen, & Ewart, 1994; Ewart, 1989; Rudolph & McAuley, 1995). According to Tucker, Cole, & Friedman (1986), fitness acts as a buffer against stress. Unfit persons generally have more distress in life than fit persons.

Weight-control Behavior

Obesity continues to plague our society. Obesity is a major health problem, with an estimated 34 million Americans aged 20-74 being 20% or more above their “ideal” weight (Crimmins Hintlian, 1995). Morbid obesity is a health hazard with 12-fold increase in mortality for persons aged 25-34 (Crimmins Hintlian, 1995). The most important medical complication of obesity is an increase in mortality from coronary artery disease. In order to decrease morbidity and mortality related to obesity, effective ways for persons to maintain their ideal body weight must be found.

Weinberg, Hughes, Critelli, England, & Jackson (1984) discovered that in their weight loss program, persons with high pre-existing self-efficacy had increased weight loss. When self-efficacy was enhanced by “having subjects attribute successful task performance to a previously unrecognized capacity”, they found that people lost more weight. Bernier & Avard (1986) came to the same conclusion that higher self-efficacy was associated with increased weight loss; and in addition found that those with higher self-efficacy had lower weight loss program dropout rates.

Nutrition Behavior

Healthy nutrition leads to a healthier, longer life span (Clark, 1996). The challenge to health care providers is to find ways to encourage and maintain a healthy diet for patients. Self-efficacy may be a useful tool for practitioners to use in order to improve the effectiveness of counseling. Several studies have correlated higher self-efficacy scores with dietary changes to improve health (Smith &
Owen, 1992; Dewolfe & Shannon, 1993; McCann et al, 1995; Vega et al, 1988; and Sheeshka, Woolcott, & MacKennon, 1993). Lower self-efficacy scores were associated with lower levels of positive eating habit changes (Sanders-Phillips, 1994). The use of measures to increase an individual’s self-efficacy may be effective means to help persons adopt healthy eating practices.

Smoking Cessation Behavior

Cigarette smoking is the major preventable cause of death in the United States (Rigotti, 1995). Approximately 27% of Americans continue to smoke despite intensive public health effort to discourage smoking (Center for Disease Control, 1992). Seventy percent of participants in formal smoking cessation programs will relapse to smoking within a year (Shiffman, 1993).

Several studies, (Kowalski, 1997; DiClemente, 1981; Macnee & Talsma, 1995; and Strecher, 1986), have found that self-efficacy scores are higher for those persons who successfully progress through the smoking cessation program. Maintainers of smoking cessation showed significantly higher self-efficacy scores than those who failed. Kowalski (1997) found that pre-program self-efficacy predicted 75% of patient’s adherence or non-adherence to the smoking cessation program.

EXERCISE AND SELF-EFFICACY

Perceptions of personal efficacy have typically been identified as important predictors of exercise behaviors (McAuley, Lox, & Duncan, 1993; O’Leary, 1985; Fontaine & Shaw 1995; Vidmar & Rubinson, 1994). There has not been as much research, however, regarding the effects that exercise may have on changing self-efficacy.

A review of the literature found a number of studies that suggest that exercise increases an individual’s self-efficacy (Table 1). Forms of exercise used in the research studies included weight training, aerobic exercise, or both. The aerobic exercises used included cycling, running, and walking. Weight training consisted of either circuit weight training or free weights. Most studies looked at only one form of exercise in their study.
Stewart, Mason, & Kelemen (1988) compared circuit weight training, which is weight training and cardiovascular exercise combined, to cardiovascular only exercise. Those who participated in the circuit weight training had more confidence and higher self-efficacy in their ability to perform arm and leg tasks compared to the cardiovascular only group. The cardiovascular only group actually declined in their self-efficacy. Arm tasks included: lifting heavy objects and doing push-ups. Leg tasks included: walking at a steady 3-mph pace, jogging at a steady 5-mph pace, and climbing stairs without stopping. All the other studies that involved aerobic exercise, excluding Stewart (1988), found that self-efficacy increased during and after exercise (Table 1).

Self-Efficacy Scales

Clearly there was no uniformity of self-efficacy scales in these studies. Some studies, such as the one above, measured self-efficacy based on the subject’s confidence that he or she could perform the task in question. Caruso & Gill (1992) asked subjects to rate how confident (self report) they were in performing a given number of repetitions for certain weight lifting exercises based on a scale of 0-100% (see table 1 for results). Vidmar & Rubinson (1994) also used the self-report of confidence subjects had in performing activities involving: lifting, jogging, walking, climbing stairs, cycling, and engaging in sexual intercourse.

Holloway, Beuter, & Duda (1988), Stidwell & Rimmer (1995), and Toshihiko, Don, Zaichkowsky, & Delizonna (1997) used a self-efficacy scale developed by Ryckman, Robbins, Thornton, & Cantrell in 1982. This self-report scale measured subjects’ general confidence. Some examples of the items on the Ryckman (1982) self-efficacy scale include “sometimes I don’t hold up well under stress; I am not hesitant about disagreeing with people bigger than me; and I find that I am not accident prone”. Ryckman tested the physical self-efficacy scale in six different studies with yes/no scale and found the test-retest and alpha reliabilities to be highly satisfactory with an alpha of .81. Ryckman found that subjects with positive perceptions of their physical capabilities outperformed those
with lower perceptions. Subjects that perceived themselves as physically competent (increased self-efficacy) spent more time involved in sport activities and were more diverse in sport activities.

In studies conducted by McAuley et al (1991, 1992, 1993, 1995) and Rudolph & McAuley (1995), self-efficacy tools developed by Bandura were used (1977, 1986) in order to measure individuals’ confidence in tasks. Bandura’s self-efficacy scales have internal consistencies in which all alphas are > .85. Bandura’s self-efficacy scale determined subjects’ beliefs in their physical capabilities to execute sit-ups, bicycling, and walking/jogging. These studies found an increase of self-efficacy with exercise.

Schwarzer and Jerusalem (1993) developed a general self-efficacy scale that has a Cronbach alpha ranging from .77 to .89 depending on the sample chosen. This scale has not been applied to exercise (Figure 1).

Type Of Exercise

Three research studies (Conn 1998; Rudolph & McAuley, 1995; Vidmar & Rubinson 1994) viewed past exercise practices of subjects and measured their self-efficacy and made comparisons. These studies found that those subjects with a history of exercising had higher levels of self-efficacy. The non-exercisers had lower self-efficacy measures.

In 1995, Tate, Petruzzello, & Lox examined cycling at 55% max VO2 compared with 70% max VO2, and the increase in self-efficacy was virtually equal. Simply engaging in exercise increases self-efficacy, but the intensity of the exercise may not be an important factor.

Toshihiko (1997) found that weight training exercise increased self-efficacy with no significant differences between high and low intensity weight lifting. In order to maximize an individual’s self-efficacy through exercise, the intensity of exercise must be regulated closely so that the exerciser continues to be successful at the activity. Success leads to continued exercise, and exercise increases the individual’s self-efficacy regardless of the intensity of the exercise. Higher self-efficacy leads to
greater adherence to exercise (Sallis et al., 1986, Dishman, 1988, Fontaine & Shaw, 1995, Garcia & King, 1991). This leads to a positive feedback loop including success with activity, increased self-efficacy, and greater exercise adherence.

It is important that the exercise program include strength training (weight lifting) because Stewart (1988) found that those who only did aerobic exercise decreased in their self-efficacy while those who performed strength training and aerobic exercise increased their self-efficacy.

**IMPLICATIONS**

Self-efficacy is the mediator between knowledge and action, and it influences the selection of behavior, the environment in which the behavior occurs, and the amount of effort and perseverance expended on performing the behavior (Berarducci & Lengacher, 1998). Practitioners have the opportunity to promote optimal levels of self-efficacy for patients. Bandura (1986, 1997) suggested that persons who have greater self-efficacy are not only more successful but are also healthier. They are healthier because they are more likely to adhere to exercise programs and they are more compelled to carry out health behaviors such as weight control, stress management, and nutritional compliance.

The first step for practitioners is to identify persons who are engaging in, or at risk for engaging in, unhealthy behaviors such as tobacco abuse, stressful lifestyle, and unhealthy diet. Next, an assessment of self-efficacy may be done to tailor a program to target their specific self-efficacy needs. Persons with low self-efficacy may benefit from activities aimed at increasing self-efficacy, prior to focusing on health behavior issues.

There is no self-efficacy scale that is considered to be optimal. Therefore, practitioners can find a scale which is specific to a certain health behavior they are interested in, such as smoking cessation or weight control; they can use a general self-efficacy scale such as the ones developed by Ryckman.
(1982), Schwarzer & Jerusalem (1993) or Sherer et al (1982); or they can develop their own self-efficacy scale and determine its reliability and effectiveness.

One way to increase an individual’s self-efficacy is through exercise. By increasing self-efficacy an individual would be more apt to engage in healthy behaviors such as effectively dealing with stress, managing their weight, complying with a healthy diet, cessation of smoking, and adhering to exercise.

For many persons it is difficult to start a regular exercise program because of numerous factors such as perceived barriers, lack of support, or low self-efficacy. How can people be persuaded to start exercising so that they are less likely to succumb to unhealthy behaviors and adhere to those behaviors that are healthful and promote a decrease in morbidity and mortality? Their self-efficacy may need to be increased prior to attempting a change in behavior.

Beliefs in personal efficacy can be strengthened in four principal ways (Bandura, 1986). The first is guided mastery of experiences, which involves learning and practicing appropriate behaviors and concentrates on building coping capabilities. This is done by breaking the desired behavior into small, graded tasks that are easily attainable in a relatively short time. Things such as social support, positive incentives, and feedback are important self-efficacy builders. Once a component of a task is accomplished, another is added until the whole behavior is achieved. Arranging for “quick success” can turn self-doubters into self-believers (Bandura, 1997). Easy, accomplishable tasks lead to quick successes and increased self-efficacy. Practitioners can provide straightforward accomplishable exercise prescriptions to move patients toward increasing their self-efficacy. Figure 2 provides steps for practitioners to promote exercise and self-efficacy and it is described later in the paper.

Bandura’s second approach to building self-efficacy centers on the power of social modeling to build skills for a particular behavior and learn coping strategies. Social modeling involves learning the skills of a behavior by simply watching others. Models enhance self-efficacy because patients
successfully carry out tasks after the model has done so. Exercise trainers or leaders who can provide social modeling may help to enhance a patient’s self-efficacy.

Social persuasion, the third efficacy builder, instills comments that encourage patients to believe that they have what it takes to succeed in changing their health habit. Activities and exercise are explained and geared in a manner that brings success. For example, for someone who has never previously exercised and wishes to start exercising, a goal of doing ten to twenty minutes of varied aerobic exercise two times a week would provide small successes that lay the foundation for accomplishing a large success of doing aerobic exercise for greater than thirty minutes three times a week.

Social persuasion helps patients to accomplish small successes and will lead to increased self-efficacy, which will propel the patient towards meeting the big success such as improved health behaviors. The steps provided for practitioners to promote exercise and self-efficacy is a clear example of starting with small successes and gradually working towards larger successes (Figure 2).

The last method to increase one’s self-efficacy is accomplished by reducing negative physiological reaction or helping individuals to interpret them in less pessimistic ways. For example, exercise may include muscle aches and shortness of breath, which avert some individuals from exercise. By explaining to the person that these symptoms signify that the body is working to improve its strength and capacity, this person may look at this bodily action in a different light.

**STEPS FOR PRACTITIONERS TO PROMOTE EXERCISE AND SELF-EFFICACY**

Figure 2 provides a guide for practitioners to create an exercise prescription that is based on their patients’ personal self-efficacy level. This model was created by Jennifer Schaal Fletcher and it has not yet been tested in research.

Practitioners first assess their patient’s self-efficacy using Schwarzer’s general self-efficacy scale (Figure 1) and classify them into the following groups: low, moderate, or high self-efficacy level. Next
the patient is prescribed an exercise program based on their self-efficacy level. Regardless of the self-efficacy level the exercise prescription includes both aerobic exercise and weight training. Low self-efficacy patients are encouraged to use a variety of exercise equipment. For example, ride bicycle for five minutes, walk on treadmill for five minutes, and climb stair-stepper for five minutes. Moderate and high self-efficacy individuals can choose a variety of aerobic exercises or they can stick to one type of aerobic exercise.

Patients base their intensity level on the exercise effort scale (EE) scale (Figure 3). The EE scale asks the question “How much of your maximum effort do you feel like you are exercising?” The EE scale provides patients with a tool that they can use to evaluate and adjust their intensity level. Patients are advised to stay in the recommended exercise effort range for their self-efficacy level which are listed in Figure 3.

Weight lifting involves completing a designated number of sets based on self-efficacy level. A set is a group of repetitions of an exercise movement done consecutively until the designated number is reached. For example, low self-efficacy individuals complete one set of 6-8 repetitions. Weight lifting should include the following muscle groups: biceps, triceps, deltoids, latissimus dorsi, trapezius, erector spinae, hamstrings, quadriceps, gastrocnemius, soleus, and abdominal muscles. The higher the self-efficacy level the greater number of sets and repetitions are completed.

Throughout the exercise program the individual should complete a daily exercise log. The log becomes an efficacy builder, mastery of experience, because it unveils successes and progress through the exercise program. Efficacy builders, as discussed earlier in paper, should be instituted throughout the exercise program.

In order to evaluate patients’ success with their exercise program, self-efficacy level will be re-evaluated on an ongoing basis. The patients’ exercise prescription will then be changed based on their new self-efficacy level. The goal for patients is to increase their self-efficacy level. The increase in self-
efficacy level is quite individualized, some people may increase gradually, while others may increase quickly. If there is a person who decreases in self-efficacy level, more efficacy builders need to be initiated.

Exercise not only increases self-efficacy but it also improves mood, decreases stress, and improves health behaviors. Practitioners should look for or ask about these changes with their patients. As individuals get into the moderate and high self-efficacy levels they should notice improvement in strength, better body composition (decrease in body fat, increase in muscle mass), and increased VO2 max (the amount of oxygen utilized by the body at maximum effort).

CONCLUSIONS

The health benefits of exercise and physical activity have been documented to offset the relative risk of morbidity and mortality from such disease conditions as coronary artery disease, obesity, cancers, and overall mortality (Blair et al, 1989; and Bouchard, 1990). The literature suggests that exercise also has psychological implications. Self-efficacy, the belief and conviction that one can perform a given activity (Caruso & Gill, 1992), is enhanced with exercise. Research has also found that those persons with increased self-efficacy are more likely to adhere to exercise programs (Dishman, 1988; Sallis et al, 1986). Persons with greater self-efficacy expectations also have more success with a variety of health behaviors, such as smoking cessation, weight control, stress reduction, nutritional compliance, and exercise adherence (O’Leary, 1985; Bernier & Avard, 1986; Kowalski, 1997; Vega et al, 1988). Therefore, measures to increase self-efficacy may not only lead to greater adherence to exercise programs, but may also enhance other health behaviors.

One of the goals of practitioners is to help patients initiate and adhere to an exercise program. Practitioners often give the basic exercise prescription of thirty minutes of cardiovascular exercise at least 3 days a week. This exercise prescription does not take into account the patients’ self-efficacy,
their confidence in their ability to carry out that exercise prescription. Exercise prescriptions need to be individualized based on the individual’s self-efficacy level. If persons are given an exercise prescription that is specifically matched to their self-efficacy level, they may be more successful at adhering to the exercise regimen and making positive health behavior changes. Enhancing their general self-efficacy could make them more confident and successful in everyday tasks.

In order for practitioners to develop exercise prescriptions which maximize individuals’ self-efficacy more research needs to be conducted. Further research needs to be conducted comparing varying exercise intensity and duration and the effect it has on self-efficacy. Also more studies are necessary which compare different exercises, i.e. aerobic exercise vs. weight training, and the effects on self-efficacy. Lastly, there is a need to examine whether exercise programs which incorporate self-efficacy manipulation improve health behavior change. More information in this area would lead to improved exercise prescriptions, greater exercise adherence, positive health behavior changes, and possibly a decrease in morbidity and mortality.
<table>
<thead>
<tr>
<th>INVESTIGATOR</th>
<th>YEAR</th>
<th>SUBJECTS</th>
<th>TYPE OF EXERCISE</th>
<th>CONCLUSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caruso</td>
<td>1992</td>
<td>N=65, 18-30 years of age</td>
<td>Weight training</td>
<td>Weight training increased weight training SE</td>
</tr>
<tr>
<td>Conn</td>
<td>1998</td>
<td>N=147, ≥65 years</td>
<td>Varied-lifelong exercise</td>
<td>Retrospect- lifelong leisure exercise had significant positive effects on SE</td>
</tr>
<tr>
<td>Holloway</td>
<td>1988</td>
<td>N=59, adolescent girls</td>
<td>Weight training</td>
<td>Wt training increased SE</td>
</tr>
<tr>
<td>McAuley</td>
<td>1991</td>
<td>N=81, 45-65 years</td>
<td>aerobic</td>
<td>Exercise increased SE</td>
</tr>
<tr>
<td>McAuley</td>
<td>1992</td>
<td>N=88, 45-64 years</td>
<td>Graded exercise test</td>
<td>Exercise bout increased SE</td>
</tr>
<tr>
<td>McAuley</td>
<td>1993</td>
<td>N=44, 45-65 years</td>
<td>Acute bout of exercise</td>
<td>Exercise bout increased SE</td>
</tr>
<tr>
<td>McAuley</td>
<td>1995</td>
<td>N=32, 45-85 years</td>
<td>12 min bike</td>
<td>Exercise bout increased SE</td>
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<tr>
<td>McAuley</td>
<td>1995</td>
<td>N=56, 45-64 years</td>
<td>GXT &amp; 40 min aerobic exercise</td>
<td>Extended exercise had greater increase in SE than acute bouts of exercise</td>
</tr>
<tr>
<td>Rudolph</td>
<td>1995</td>
<td>N=60, undergraduate students</td>
<td>aerobic</td>
<td>Exercise increased SE. Also Retrospect-previously more active persons have higher SE</td>
</tr>
<tr>
<td>Stewart</td>
<td>1988</td>
<td>N=25 males in cardiac exercise program, &lt; 70 years</td>
<td>2 groups: Circuit weight training and aerobic &amp; aerobic only</td>
<td>CWT increased significant in arm and leg SE; aerobic only exercise decreased their SE</td>
</tr>
<tr>
<td>Stewart</td>
<td>1994</td>
<td>N=51, 25-59 years Males with mild hypertension</td>
<td>Aerobic and strength</td>
<td>Exercise training increased SE</td>
</tr>
<tr>
<td>Stidwell</td>
<td>1995</td>
<td>N=45, age 82.9± 5.3</td>
<td>Strength, balance, cardiovascular</td>
<td>Exercisers higher SE than non-exercisers</td>
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<tr>
<td>Tate</td>
<td>1995</td>
<td>N=20, college age</td>
<td>Cycling @ 55% VO2 &amp; @ 70% VO2</td>
<td>Exercise increased SE in both groups, no difference between intensities</td>
</tr>
<tr>
<td>Toshihiko</td>
<td>1997</td>
<td>N=42, 60-86 years</td>
<td>Weight training</td>
<td>High and low intensity wt training increased SE</td>
</tr>
<tr>
<td>Vidmar</td>
<td>1994</td>
<td>N=138, Phase II graduates of cardiac rehab, 45-64 years</td>
<td>Aerobic</td>
<td>Retrospect- exercisers had higher SE, non-exercises low SE</td>
</tr>
</tbody>
</table>

Table 1 key:
SE = self-efficacy
CWT = circuit weight training
VO2 = oxygen uptake during exercise
GXT = graded exercise testing
The General Self-Efficacy Scale
By Ralf Schwarzer & Mattias Jerusalem, 1993

Response Format:
1 = not at all true  2 = hardly true  3 = moderately true  4 = exactly true

1 I can always manage to solve difficult problems if I try hard enough.  1  2  3  4
2 If someone opposes me, I can find means and ways to get what I want.  1  2  3  4
3 It is easy for me to stick to my aims and accomplish my goals.  1  2  3  4
4 I am confident that I could deal efficiently with unexpected events.  1  2  3  4
5 Thanks to my resourcefulness, I know how to handle unforeseen situations.  1  2  3  4
6 I can solve most problems if I invest the necessary effort.  1  2  3  4
7 I can remain calm when facing difficulties because I can rely on my coping abilities.  1  2  3  4
8 When I am confronted with a problem, I can usually find several solutions.  1  2  3  4
9 If I am in trouble, I can usually think of something to do.  1  2  3  4
10 No matter what comes my way, I am usually able to handle it.  1  2  3  4

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Suggested scoring developed by Jennifer Schaal Fletcher:

Low self-efficacy  ≤ 13
Moderate self-efficacy  14-27
High self-efficacy  >27
## STEPS FOR PRACTITIONERS TO PROMOTE EXERCISE AND SELF-EFFICACY

### Figure 2

- **STEP ONE:** Assess self-efficacy
  - Use self-efficacy scale by Schwarzer (1993) or other desired scale

- **STEP TWO:** Classify patient based on self-efficacy scale
  - Schwarzer's general self-efficacy scale
    - Low self-efficacy: score ≤ 13 (May benefit SE enhancement before exercise program)
    - Moderate self-efficacy: score 14-27
    - High self-efficacy: score > 27

- **STEP THREE:** Exercise as a means to increase self-efficacy

- **STEP FOUR:** Evaluation

<table>
<thead>
<tr>
<th>SELF-EFFICACY LEVEL</th>
<th>LOW</th>
<th>MODERATE</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PLAN</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerobic Exercise</td>
<td>10-20 min varied</td>
<td>20-30 min any equipment</td>
<td>&gt; 30 min any equipment</td>
</tr>
<tr>
<td></td>
<td>exercise effort &lt; 3</td>
<td>exercise effort 4-6</td>
<td>exercise effort 7-10</td>
</tr>
<tr>
<td>Weight Training</td>
<td>1 set 6-8 repetitions</td>
<td>2 sets 8-10 reps</td>
<td>3 sets 10-12 reps</td>
</tr>
<tr>
<td></td>
<td>low weight</td>
<td>moderate weight</td>
<td>moderate- heavy weight</td>
</tr>
<tr>
<td>Goals</td>
<td>Completing exercise time, 2-3 x/wk</td>
<td>Frequency goal 3-5 x/wk</td>
<td>Higher intensity</td>
</tr>
<tr>
<td>Efficacy Builders</td>
<td>Daily Exercise Log</td>
<td>same</td>
<td>same</td>
</tr>
<tr>
<td></td>
<td>Social Persuasion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Modeling &amp; Support</td>
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<td></td>
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<tr>
<td></td>
<td>Ensuring success</td>
<td></td>
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<tr>
<td></td>
<td>Reducing Negative Reactions</td>
<td></td>
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<tr>
<td>Evaluation: Self-efficacy</td>
<td>Measure SE within 2 months of starting exercise, then every 6 months</td>
<td>Measure SE every 6 months</td>
<td>Measure SE every 9-12 months</td>
</tr>
<tr>
<td>Practitioners Parameters For Success</td>
<td>Patient has: Increased Self-Efficacy</td>
<td></td>
<td>~ Those listed to left &amp; Increased strength and VO2 max</td>
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<tr>
<td></td>
<td>Better mood</td>
<td>Improved body composition ~</td>
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<tr>
<td></td>
<td>Decreased stress</td>
<td></td>
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<td></td>
<td>Positive health behavior</td>
<td></td>
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<td></td>
<td>Changes</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Increased energy</td>
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</tbody>
</table>
### EXERCISE EFFORT SCALE

How much of your maximum effort do you feel like you are exercising? Rate between 1-10

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th>5</th>
<th>Exercising @ 50% of Max</th>
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<th></th>
<th></th>
<th>10</th>
<th>Exercising @ 100% of Max</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>Exercising @ 100% of Max</td>
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<td></td>
</tr>
</tbody>
</table>

Max = maximum effort that you can exercise

Exercise Effort Scale created by Jennifer Schaal Fletcher

REFERENCES


