



# EXERCISE ADHERENCE: TRANSLATING THE EVIDENCE ON BARRIERS AND FACILITATORS INTO PRACTICE

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Fewer than half of all American adults achieve the recommended amount of physical activity for good health, which is the equivalent of at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity exercise per week. People experience both physical and logistical barriers to exercising regularly, with lack of time, energy and motivation, and pain and discomfort cited most often.

Each person is unique and may feel shame or embarrassment regarding their challenges with being more active. Therefore, a health and fitness professional who can demonstrate empathy and patience is more likely to build a strong, trusting relationship with clients. While research has identified strategies and approaches to help improve exercise adherence, it is paramount that these strategies be tailored to each individual's unique barriers and circumstances.

Utilizing behavior-change strategies can improve adherence and help people realize the many physical and psychological benefits of exercise. For example, reframing exercise as a mood/stress-management strategy instead of focusing on burning calories or weight loss may increase the perceived benefits. Additionally, assessing perceived enjoyment and exertion (and adjusting as needed) and setting up short-term, easily achievable goals can help improve self-efficacy. Social support and past experience with exercise also play significant roles in exercise adherence.



## KEY POINTS

- Although people cite lack of time and/or a dislike of exercise as major reasons for being inactive, they may not be consciously aware of all of the factors affecting their interest and motivation to exercise.
- Frequently assessing perceived enjoyment and exertion during and after exercise provides opportunities to make adjustments to reduce aversive feelings and will call attention to even subtle improvements over time.
- Health and fitness professionals are encouraged to address adherence head-on and utilize effective strategies to assist individuals with chronic pain in developing an exercise regimen, but only once the client has been cleared to exercise by his or her physician.
- Like pain and sleep, stress has a bidirectional relationship with physical activity in which greater stress is associated with less physical activity, and less physical activity is associated with greater stress.
- The relationship between stress and exercise appears to differ based on one's regular exercise habit, such that those who are regular exercisers show higher levels of exercise during stressful periods, while those who are not regular exercisers show lower levels of exercise during stressful periods.
- Reframing exercise as a mood/stress-management strategy may increase the perceived benefits of exercise, particularly for those who view exercise simply as a means to burn calories and/or lose weight.
- Setting up very simple, short-term goals that have a high probability of success may improve self-efficacy and produce behavioral momentum for individuals with low executive function.
- Facilitators of exercise adherence include past experiences with exercise and social support.
- Utilizing behavior-change strategies can improve adherence and ultimately help people achieve the many benefits of exercise to physical and mental health.

The U.S. Department of Health & Human Service's *Physical Activity Guidelines for Americans*<sup>1</sup> recommend that adults engage in an equivalent of at least 150 minutes a week of moderate-intensity physical activity, or 75 minutes a week of vigorous-intensity physical activity, in episodes of 10 minutes or longer in duration. Less than half of U.S. adults (48 percent) meet these guidelines, a concerning statistic<sup>2</sup> given the many documented health benefits of physical activity, including its preventive effect on the top two causes of death (i.e., cardiovascular disease<sup>3</sup> and cancer<sup>4</sup>) and all-cause mortality.<sup>5</sup> Lack of time, discomfort, fatigue/low energy, pain and lack of motivation are common reasons cited by individuals with inactive lifestyles, but the research literature has operationally defined barriers to exercise adherence, including biological and psychosocial factors. Studies have also identified facilitators to exercise adherence, or factors associated with highly active lifestyles. Evidence-based exercise interventions have shown some success in improving exercise adherence across a wide range of populations,<sup>6–10</sup> but widespread dissemination and implementation in healthcare and fitness settings has been slow. This piece will discuss the research literature on key barriers and facilitators to exercise adherence to help guide the work of health and fitness professionals. The appropriate means to assess and intervene upon these factors in exercise coaching interventions is also discussed. Finally, evidence-based behavioral strategies for promoting exercise adherence are described, with practical guidance for implementation by fitness and healthcare professionals.

## BARRIERS TO EXERCISE ADHERENCE

Although people cite lack of time and/or a dislike of exercise as major reasons for being inactive, they may not be consciously aware of all of the factors affecting their interest and motivation to exercise. The research literature gives a more detailed picture of the barriers to exercise, which include genetic, medical, social and behavioral factors. This section covers common barriers to exercise adherence, with guidance on how to tailor exercise coaching to address these barriers.

### *Genetics*

Although psychosocial factors are often used to explain poor exercise adherence, research has shown that neural signaling and reward systems in the brain may play a strong role in one's tendency to engage in and enjoy exercise.<sup>11</sup> Animal studies show that physical-activity levels vary by genetic strain and that mice can be selectively bred to be

more or less physically active.<sup>11</sup> Mice bred to be physically active exhibit more stress when denied opportunities to be active, will choose an exercise wheel over other activities and show increased neuronal activity when physically active.<sup>12</sup> Specific genes have been identified for their association with more physically active mice, and these genes appear to be associated with other obesity traits, such as body composition,<sup>11</sup> which suggests that sedentary lifestyle and obesity may be genetically linked.

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In human research, twin studies are used to determine the heritability of genetic traits. Such studies have shown that the tendency to be physically active appears to be an inherited trait.<sup>11</sup> Specific genes have been identified and, as in animal studies, most of these genes affect neurotransmitters in the brain (i.e., chemicals that transmit signals in the brain)<sup>2</sup> and a protein called brain-derived neurotrophic factor (BDNF).<sup>13</sup> The neurotransmitters dopamine and serotonin have been implicated specifically. Interestingly, dysfunction or absence of certain serotonin receptors is associated with low energy expenditure via physical activity, overeating and depression.<sup>14</sup> Physically active individuals have higher levels of BDNF in the hippocampus area of the brain, and this is associated with greater positive mood during exercise.<sup>15</sup> It may be the case that certain individuals have brains that are more inclined to experience mood improvement from exercise and are therefore more likely to exercise. BDNF has also been associated with increased cognitive function following exercise.<sup>13</sup> Interestingly, a study showed that 10 weeks of exercise increased BDNF levels in overweight and obese individuals,<sup>16</sup> which suggests that even those without the genetic predisposition toward higher BDNF and thus higher exercise motivation may be able to influence their brain chemistry toward a greater affinity toward exercise by maintaining the habit for some length of time. The challenge is in facilitating a long enough exercise habit to produce these changes in individuals who may not have a genetic predisposition to enjoy exercise.

### **Addressing Genetic Factors in Exercise Coaching**

Health and fitness professionals should consider that varying levels of motivation to exercise may derive at least in part from genetic factors. As such, attributing non-adherence to lack of “willpower” or low motivation could result in a client feeling demoralized and frustrated. Instead, empathizing with clients about their experience with exercise, regardless of how negative, may strengthen the relationship. Clients may be encouraged to know that persistence in the initial phases of an exercise regimen may result in increased motivation and enjoyment over time via brain chemistry changes. Frequently assessing perceived enjoyment and exertion during and after exercise provides opportunities to make adjustments to reduce aversive feelings and will call attention to even subtle improvements over time. Because studies have shown an adverse effect of high perceived exertion,<sup>17</sup> exercise programming that matches the client’s comfort level are likely to result in better adherence.

Ultimately, some individuals will not enjoy the subjective experience of exercise as much as others, so selecting activities that add external pleasures, such as entertainment (e.g., television or reading), socializing (e.g., workout buddy), being with animals (e.g., walking the dog), team play (e.g., basketball), being outdoors (e.g., hiking), social consciousness (e.g., fundraiser community walks) or competition (e.g., races) may be very helpful with such individuals. It is important though, that individuals cannot obtain these pleasures via other means, as they may be inclined to continue to skip exercise while still indulging. For example, television shows are entertaining, but people can watch them without exercising. Helping clients restrict certain enjoyable shows to exercise time (e.g., using behavioral contracts to commit to only watching *Downton Abbey* while on the treadmill) may enhance the effectiveness of this strategy.

### **Sleep**

The relationship between sleep and exercise is bidirectional, such that sleep is a barrier to exercise but exercise is associated with better sleep duration and quality.<sup>18</sup> Studies have shown that individuals with poor sleep are less active than their rested counterparts,<sup>19,20</sup> and that a night of poor sleep quantity and quality predicts less physical activity on the subsequent day.<sup>21–23</sup> The effect of poor sleep on physical activity has even been experimentally demonstrated in laboratory studies that deprive participants of sleep and

monitor their subsequent activity levels.<sup>24,25</sup> The effect of sleep on physical activity may even be sustained over time, as evidenced by studies showing how poor sleep predicts lower rates of physical activity over several years.<sup>26,27</sup> Altogether, research suggests that poor sleep can have both acute and long-term effects on physical activity.

Wake time may also be a factor in physical activity. Research has shown that waking up earlier in the morning is associated with greater physical activity during the day.<sup>28</sup> It remains unclear if waking up earlier results in a more active lifestyle or if people who wake up earlier are more likely to be active for other reasons. Regardless, individuals who routinely sleep late might try shifting their sleep schedule and evaluating the impact on physical activity.

Although poor sleep predicts lower physical-activity levels, studies have failed to show that sleep treatments actually improve physical activity.<sup>29</sup> Insomnia and sleep apnea treatments are highly effective at improving sleep quantity and quality, but do not result in spontaneous increases in physical activity. On the other hand, exercise interventions have shown effects on both physical activity and sleep.<sup>29</sup> One meta-analysis found that exercise training generally results in modest improvements in sleep.<sup>30</sup> A more recent trial showed that a brisk walking intervention supported with electronic activity monitors not only increased walking from 66 to 219 minutes per week on average but also had significant effects on sleep among people with insomnia.<sup>18</sup> Exercise interventions might be sufficient to improve both sleep and physical-activity levels in some people. More significant sleep problems however may require referral for sleep treatments, particularly in the case of obstructive sleep apnea.

### ***Sleep Assessment***

The assessment of the type and severity of sleep problems is important in professional exercise settings so that proper care can be arranged. Sleep problems that reach clinical severity may be due to chronic insomnia or obstructive sleep apnea. In either case, medical care is likely indicated. Brief screeners are publicly available and may be useful to administer to clients who report sleep difficulty or lack of restfulness during the day even with adequate sleep duration.

### ***Clinical Insomnia***

Insomnia is characterized by difficulty falling asleep, frequent wake-ups, waking up too early, and not feeling



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rested. These symptoms must result in six or fewer hours of sleep on at least three nights per week to be considered clinically significant.<sup>31</sup> Insomnia can be associated with irritability, depression, difficulty focusing or paying attention, headaches and other health problems.<sup>32</sup> The Insomnia Severity Index is a seven-item questionnaire that identifies clinically significant insomnia.<sup>33,34</sup> The items and scoring are publicly available<sup>35</sup> and the questionnaire can be administered by the client or the professional. When a client scores in the clinically significant range, he or she should be encouraged to bring this information to a primary care physician. The benefits of regular exercise should also be discussed, given research showing that exercise may improve insomnia symptoms.<sup>18</sup> Exercise might also reduce reliance on sleep medications, many of which can result in dependency.

### ***Obstructive Sleep Apnea***

Obstructive sleep apnea (OSA) is a sleep disorder characterized by episodes during which the individual stops breathing during sleep typically due to an airway obstruction.<sup>36</sup> This can lead to serious health consequences, including cardiovascular disease and type 2 diabetes.<sup>37</sup> Symptoms of OSA include daytime sleepiness, snoring and shortness of breath that awakens the individual from sleep. Evidence-based treatments for OSA include continuous positive airway pressure and surgery.<sup>38</sup> Exercise is not likely to lead to improvements in OSA, thus identifying this disorder and referring for medical care is paramount. OSA is likely to be a barrier to exercise, given that the individual will often feel too tired to exercise. It should also be noted that 80 percent of OSA goes undiagnosed, meaning that most people with this disorder live with it unknowingly.<sup>39</sup>

Because poor sleep is so often reported by clients seeking exercise coaching, the health and fitness professional may be instrumental in flagging problems and facilitating proper care for people with sleep disorders. When sleep apnea is suspected, the STOP-BANG questionnaire can be used to determine whether clinical referral is indicated.<sup>40</sup> The STOP-BANG is an eight-item questionnaire with simple scoring instructions that quickly identifies probable sleep apnea.<sup>41</sup> Those screening positive should be referred to their physicians for further screening and treatment.

### ***Addressing Sleep in Exercise Coaching***

When clients frequently report fatigue, tiredness, low energy or lack of sleep as reasons they are having difficulty exercising, the first course of action is assessment of clinical sleep disorders. When disorders are identified, referrals can be made. Following up with clients to ensure they followed through with referrals is important, as some people are so accustomed to feeling tired that they do not view it as a potentially serious medical problem. Leaving a sleep disorder untreated is likely to result in chronically low exercise adherence. When a client reports feeling tired and/or low energy, but does not have poor sleep or a sleep disorder, stress and/or depression may be implicated. See the section on “Stress and Depression” for more on addressing these issues.

Although feeling tired may be a barrier to exercise adherence, emphasizing to clients the impact that physical activity may have on their sleep quantity and quality may increase their motivation to be consistent. If a client is feeling more emotionally tired than physically tired (i.e., poor sleep), exercise is likely to result in much improvement in their energy level and alertness. Having the client keep a journal of hours slept per night and minutes exercised per day may increase the client’s awareness of the relationship between sleep and exercise. Encouraging clients to share the sleep journal with their physicians will also help their medical treatment. The health and fitness professional has a unique opportunity to educate people about the link between sleep and physical activity and to facilitate assessment and treatment, which can ultimately impact the striking rates of underdiagnosis and undertreatment of sleep disorders in the U.S.

## **PAIN**

Chronic musculoskeletal pain affects more than 100 million adults in the U.S. and it accounts for up to \$300 billion in

healthcare costs,<sup>42</sup> with back pain and knee pain being the most common pain conditions.<sup>43</sup> Clinical guidelines point to education and exercise programs as the most effective non-pharmacological treatments for chronic pain; however, exercise adherence can be a challenge.<sup>44,45</sup> Adherence to national physical-activity guidelines among adults with chronic pain is lower than average, and over 50 percent of chronic pain patients do not perform medically prescribed exercises according to prescription.<sup>46,47</sup>

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Patient beliefs about pain and the importance of exercise may shed light on low adherence rates. One qualitative study of patients with chronic pain reported that patients who believed their pain was unlikely to improve were less likely to follow through with exercises.<sup>48</sup> In this study, credibility of the exercise treatment was also an important factor for exercise adherence cited by patients. Patients who doubted the treatment would work or did not understand the rationale for exercise were less likely to adhere to exercise recommendations. Patients also reported that the pain itself was a reminder to do their exercises and so on days they did not experience pain they often forgot to do their exercises. This study also revealed barriers to exercise, including difficulty fitting the exercises into the daily routine, feeling too tired and symptoms from other medical problems. Finally, pain patients said that going to a recreational center and/or having entertainment during exercise help them to be more consistent with exercise.

### ***Addressing Pain in Exercise Coaching***

When clients report pain, the first consideration is whether the pain condition has been evaluated by a physician. An Institute of Medicine report on chronic pain notes two major issues, (1) chronic pain is often undertreated and (2) opiate medications are overprescribed, which has led to an epidemic of opiate dependence and abuse.<sup>49</sup> The National Institute on Drug Abuse reports that since 1999 opiate prescriptions have increased two- to threefold, over 2 million U.S. adults are addicted and the rate of accidental overdose of opiate medications has quadrupled.<sup>50</sup> The health and fitness professional is uniquely positioned to play a key role



in addressing these problems. Clients who have chronic pain that has not been evaluated by a physician should be encouraged to see their physicians to determine whether the pain is related to a medical condition that can be treated. Clients who chronically use opiates to manage their pain may benefit from exercise coaching, given that exercise is likely to reduce pain and thus the reliance on opiate medications for pain management. Health and fitness professionals can discuss the risks of opiate use, including dependence and accidental overdose with clients and refer them to speak to their physician about options.

One study suggested that people with chronic pain consider three types of activity: general lifestyle activity, fitness exercise and medical exercise.<sup>51</sup> The health and fitness professional is encouraged to work with the client to address goals for these categories separately, especially if the client is not clear on which activities meet his or her goals for the different categories. For example, a client may take the stairs at work each day (a general activity goal) and count it as having met his or her daily fitness exercise goal, resulting in less daily fitness exercise. On the other hand, some of the client's medical exercise may actually count toward the 150 minutes weekly fitness exercise goal, in which case the client may be accomplishing more than he or she thinks.

A systematic review of interventions targeting exercise adherence in chronic pain patients revealed that the most effective interventions are those that directly address adherence.<sup>52</sup> Supervised exercise (i.e., the patient exercises in the presence of an instructor), individualized exercise plans, programs that include refresher or follow-up sessions, the provision of supplementary material (e.g., videos), programs that are based on graded activity (i.e., exercise goals increase slowly over time) and those utilizing cognitive-behavioral strategies (e.g., goal setting, skills acquisition, self-monitoring, relaxation techniques, active coping and

problem solving) are examples of those that have shown the greatest effects. Health and fitness professionals are encouraged to address adherence head-on and utilize these effective strategies to assist the individual with chronic pain in developing an exercise regimen.

## STRESS/DEPRESSION

Like pain and sleep, stress has a bidirectional relationship with physical activity in which greater stress is associated with less physical activity, and less physical activity is associated with greater stress.<sup>53</sup> Stress can be measured via objective means, for example, in terms of number of daily stressors or stressful life events (e.g., divorce or the death of loved one); or subjectively, in terms of general perceived stress. Both measures of stress have been shown to be associated with lower rates of physical activity.<sup>53</sup> One review revealed that studies generally find that physical activity is lower in times of acute stress (e.g., final exams) and lower among people who experience chronic stress (e.g., caregivers of sick family member).<sup>53</sup> They also found that the relationship between stress and exercise appears to differ based on one's regular exercise habit, such that those who are regular exercisers show *higher* levels of exercise during stressful periods, while those who are not regular exercisers show lower levels of exercise during stressful periods.<sup>53</sup> This could perhaps be a result of certain people having a predisposition to experience stress reduction from exercise, or perhaps that stress reduction is not experienced until a person achieves a certain level of exercise. Regardless, not all individuals will have poor adherence to exercise in the presence of stress.

Depression is a formal psychological disorder characterized by depressed mood and/or loss of pleasure more often than not for at least two weeks, and these symptoms interfere with daily functioning in some aspect of life, such as occupation or relationships.<sup>31</sup> Like stress, depression is associated with lower physical activity.<sup>54</sup> Generally, patients with depression can become less engaged in many reinforcing aspects of life, including, but not limited to, physical activities. One study of depressed adults found that more severe depression, higher body mass index, and presence of a medical comorbidity were associated with the lowest exercise adherence.<sup>54</sup> The presence of depression may signal other disorders that may also interfere with exercise (e.g., chronic pain, diabetes or sleep disorders). Numerous medical conditions have a high comorbidity with depression.<sup>55</sup> Therefore, taking a full

medical history may be necessary to understand the complex interplay between the individual's medical and psychological symptoms.

### ***Addressing Stress and Depression in Exercise Coaching***

To identify whether a client should be referred for further evaluation and treatment for clinical depression, the health and fitness professional may use the Patient Health Questionnaire two-item version (PHQ-2).<sup>56</sup> This screener is quick to administer and score.<sup>56</sup> Those scoring 3 or above should be referred to their primary care provider for further assessment and treatment. Many evidence-based treatments are available for depression, including medication and psychotherapies (e.g., cognitive behavioral therapy). Although research has shown that exercise can be as effective as traditional therapies for depression,<sup>57</sup> the treatment decision should be made between the primary care provider and the patient to ensure proper diagnosis, rule out comorbidities and implement a professional evaluation of suicide risk.

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Offering extra time and support with clients affected by high stress or depression may improve their exercise adherence. One review showed that programs where exercise was directly supervised by exercise professionals produced the highest adherence among individuals with clinical depression.<sup>10</sup> No specific type or intensity of exercise appears to be more effective than another for people with depression. Therefore, helping clients select a physical activity they enjoy is likely to produce the best adherence. Small, graded goals that the client considers easy may improve adherence with people experiencing high stress and/or depression. When clients are skeptical of the utility of small amounts of exercise, it may be useful to emphasize that doing any amount of physical activity may build momentum toward their goals. Having clients keep a journal to track their moods before and after exercising and on days they do and do not exercise will help them become more aware of the relationship between activity level and mood. Reframing exercise as a mood/stress-management strategy may increase the perceived benefits

of exercise, particularly for those who view exercise simply as a means to burn calories and/or lose weight. This is particularly important given research showing that exercise can buffer the negative impact of stress on physical health.<sup>58</sup>

### **EXECUTIVE FUNCTIONING DEFICITS**

Abilities such as planning, goal setting, self-monitoring behavior, problem solving and executing plans are part of the “executive function” system in the brain.<sup>59</sup> People vary widely in their executive functioning abilities, and genetic variations have been implicated.<sup>60</sup> Executive functioning represents essential skills for adherence to exercise,<sup>61</sup> or any other complex regimen for that matter. Those with a greater executive functioning capacity will naturally find it easier to provide the necessary structure for themselves, including setting goals regularly, following through with goals and managing their time. On the other end of the continuum are people with disorders associated with executive functioning deficits, including attention deficit disorder,<sup>62</sup> intellectual disorders and cognitive functioning disorders. Such individuals may need extra assistance in developing an exercise regimen, given the complex skills necessary to do so. Even in the absence of a defined disorder, some people will just have lower capacity toward this skill set, as evidenced by a history of lack of follow-through on goals, poor planning and poor adherence to specific strategies such as self-monitoring or time management. Interestingly, poor sleep<sup>63</sup> and high stress<sup>64</sup> can contribute to poor executive function, so deficits may be due to, or exacerbated by, these factors. In turn, low executive functioning can interfere with the ability to regulate stress, which compounds the impact of each on exercise adherence.<sup>64</sup>

### ***Addressing Low Executive Function in Exercise Coaching***

Among individuals who appear to have difficulty in this area, specific instruction in executive function skills is necessary. For example, instead of simply recommending that a client keep a log of his or her exercise, a coach or trainer might assist the client on each step of setting up the log and provide specific instruction on what to log, when and how often to make entries and how to get feedback. Frequent visits provide more opportunities for structure, cues and feedback. More extensive cue and feedback systems can help, as well as engaging loved ones in this process. For example, it may be helpful to engage a spouse in the goal setting and plans for a client who is failing to follow through on goals. The spouse can then serve as a source of reminders and feedback. Individuals with executive functioning deficits

may be quick to experience frustration due to a long history of failure experiences. For this reason, setting up very simple, short-term goals that have a high probability of success may improve self-efficacy and produce behavioral momentum. Coaching should convey acceptance and empathy rather than assume that poor follow-through is a matter of low motivation, lack of interest or defiance.

## LOGISTICAL BARRIERS

Cost, access and time are three major logistical barriers to exercise adherence. The financial cost of exercise may include gym memberships, personal training fees, co-pays to see clinical exercise professionals (e.g., physical therapist or exercise physiologist), home equipment and appropriate apparel and footwear. Different physical activities can vary greatly in cost, with walking outdoors on the low end to membership at a specialty gym with regular personal training on the high end.

### Access

Regardless of cost, access to facilities and resources affects opportunity to exercise. Lack of access can result from living in an unsafe neighborhood, absence of local facilities or lack of credentialed exercise professionals (e.g., in rural settings). Low access to inexpensive activities can be particularly challenging for low-income individuals who are the most likely to encounter this combination of barriers. When it comes to access to physical-activity resources at the community level, quality of resources matters. Quality of physical-activity resources refers to whether the available resource is desirable and usable. For example, broken sidewalks, graffiti tagging in playgrounds, broken equipment and vandalism at recreation centers reduce the desirability of these community resources.<sup>65</sup> One study showed that both availability and quality of the physical-activity resources were associated with greater physical activity among community members in lower-income areas.<sup>65</sup> Access to physical activities in the work environment also plays a role in one's physical-activity adherence. Many workplaces now provide gyms, walking groups, walking routes and physical-activity breaks. One study showed that access to a work environment that is supportive of physical activity was associated with greater physical activity in females but not males.<sup>66</sup> Women may be more likely to take advantage of workplace physical-activity resources, and/or the resources available may not be ones that appeal to men.

### Time

Lack of time is an oft-cited reason for not exercising and sometimes considered an “excuse” as opposed to a legitimate barrier to exercise. Early studies showed that less discretionary time reduces the likelihood of exercising regularly, as does having children under the age of five.<sup>67</sup> Interestingly, more recent research has shown a reverse relationship between working hours and exercise, such that people who work *longer* hours are *more* likely to exercise.<sup>68</sup> However, schedule flexibility appears to be a determining factor in that relationship.<sup>69</sup> One study showed that in heterosexual couples, wives who work long hours but have flexible schedules are more likely to exercise than those who work shorter hours and/or have less schedule flexibility. Husbands with wives who have flexible schedules were also more likely to exercise than those who do not, which suggests that men benefit from the flexibility of their wives' schedules. The reverse was not true; women with husbands who had more schedule flexibility were not more active than those with husbands with less schedule flexibility. Gender and relationship roles appear to matter when it comes to striking a balance between work and time to exercise. Ultimately, flexibility in working hours appears to be extremely important, perhaps because work flexibility results in more flexibility in the time of day one can exercise. People with a static work schedule that forces exercise to occur early in the morning or late at night might need extra help in devising a feasible exercise routine.

Another work-related factor affecting exercise is job strain. Regardless of hours, high job strain is associated with less physical activity.<sup>70</sup> Job strain appears to be increasing over time along with working hours, and high working hours combined with low flexibility contribute to greater job strain.<sup>70</sup> The combination of high job strain, long hours and low schedule flexibility may be particularly toxic when it comes to developing a physically active lifestyle.

### Addressing Logistical Barriers in Exercise Coaching

The first step in addressing logistical barriers to exercise adherence is accurately evaluating what the client is actually experiencing. While many people say they do not have time to exercise, probing further to identify what the individual has access to in terms of physical-activity resources, schedule flexibility, number and ages of children, access to childcare, his or her spouse's work schedule and his or her subjective sense of job strain will provide more information from which

a plan can be devised. For example, encouraging a client with childcare responsibilities to use a recreational facility with childcare services might be helpful if such services can be afforded. Otherwise, sharing the childcare load with the spouse or other parent or family member in such a way that allows both individuals to take turns exercising might be helpful. When a client is working long and inflexible hours, planning short bouts of exercise (e.g., 10-minute increments) on working days and longer bouts on days off may be a way to achieve better consistency.

Problem-solving therapy is an effective approach to generating solutions in the face of a complex set of barriers (see Nezu, Nezu, and D’Zurilla for more details on problem-solving therapy).<sup>71</sup> Clients who are exasperated and overwhelmed may have difficulty brainstorming ways to fit exercise into an already busy schedule or accepting advice from others about how to do so. In this case, the tendency may be to react with reasons why proposed solutions will not be feasible. Offering a client a list of ideas generated after identifying the nature of his or her challenges and encouraging the client to select one to try is likely to be more successful than putting forth suggestions one at a time and opening up a discussion of the drawbacks of each. This gives the client the opportunity to make a choice, rather than have one imposed on him or her, while avoiding the tendency to focus on why any particular solution will not fit his or her lifestyle. Although “no time” seems like an excuse, it is usually an individual’s way of expressing frustration and stress about previous failure experiences with exercise. Empathy and patience will help develop a trusting coaching or training relationship, as they will have likely been the subject of self-shame or shame from others regarding the inability to develop an active lifestyle.

## **FACILITATORS OF EXERCISE ADHERENCE**

In addition to barriers, the research literature has identified facilitators of high exercise adherence. These facilitators may be leveraged in interventions to improve adherence.

## **PAST EXPERIENCE WITH EXERCISE**

Individuals with a history of a physically active lifestyle typically have the highest rates of adherence in formal exercise programs.<sup>72,73</sup> When encountering an individual who is currently sedentary but previously very active, finding out which activity he or she previously enjoyed may



*Individuals with high levels of support from family and friends tend to have higher rates of adherence.<sup>77</sup>*

help to rekindle a passion for that activity. For many, the physical activity they were previously passionate about might no longer be feasible or safe to do, which can lead to discouragement and low motivation. In this case, identifying the characteristic of that physical activity that seemed to drive their passion might lead to ideas for new activities. For example, an individual who once enjoyed long-distance running because of the competition and endurance building might find cycling or swimming to be reasonable substitutes. Access and cost should be factored into the decision as well. They should be reminded that passion takes time to develop, especially if they do not experience it in the initial phases of starting a new activity. One study showed that people with a past history of exercise have higher adherence rates to vigorous exercise, but poorer adherence rates to moderate-intensity exercise, which suggests that previously active individuals may be more amenable to a high-intensity exercise regimen.<sup>73</sup>

## **SOCIAL SUPPORT**

The social context of the individual is an important determining factor of exercise adherence.<sup>74</sup> Some individuals receive positive social influences for exercise from friends and family, while others experience negative influence, including discouragement, punishment, undermining and shaming.<sup>75</sup> Exercise social support refers to the extent to which an individual feels his or her family and friends are a source of encouragement, emotional support, physical assistance and/or useful information when it comes to exercise.<sup>76</sup> Individuals with high levels of support from family and friends tend to have higher rates of adherence.<sup>77</sup> When exercise social support from family and friends is low and/or family and friends are a source of negative influence,

social support might be obtained from exercise groups (e.g., running club), an exercise buddy, exercise classes or communities in online social networks. In one study, individuals using an online social network for weight loss reported that the support they received from the people they met online was higher than what they received from their family and friends.<sup>78</sup> Given the ubiquity of online social network use,<sup>79</sup> health and fitness professionals who create a social media presence for their work may find this to be a low-cost way to create a supportive client community as another means for disseminating education and behavioral strategies to clientele.

## EVIDENCE-BASED BEHAVIOR CHANGE STRATEGIES

Myriad exercise interventions involving a host of behavioral strategies have been tested in randomized trials over the last three decades.<sup>6–10</sup> The behavioral strategies tested have recently been inventoried in the Behavior Change Taxonomy, which includes 40 unique strategies.<sup>80</sup> A full list of strategies can be found in Michie and colleagues,<sup>80</sup> but key strategies are summarized with examples in Table 1. Incorporating these strategies into exercise coaching can improve adherence and ultimately help people achieve the many benefits of exercise to physical and mental health.

**TABLE 1**

BEHAVIOR-CHANGE STRATEGY	EXAMPLE
Provide information on consequences (costs and benefits) of engaging in exercise to people in general	“Studies show that people who exercise more often have higher-quality sleep.”
Provide information on consequences (costs and benefits) of engaging in exercise to the individual	“You may experience improved sleep as you begin to exercise more frequently.”
Provide information regarding social norms for exercise	“A lot of women your age enjoy cycling as a way to be active.”
Goal setting	“How many minutes of moderate-intensity exercise will be your goal for this week?”
Action planning—providing a detailed description of exercise plans, including frequency, days of the week, location, etc.	“Let’s talk about how often you can exercise this week, which days are best and where you would like to work out.”
Identification of barriers to exercise	“What are the biggest things holding you back from exercising on weekdays?”
Graded task assignments in which an exercise goal is broken into smaller tasks that are considered easy to accomplish	“Let’s start with 10-minute bouts of treadmill walking.”
Prompt review of exercise goals and outcomes achieved (e.g., weight loss, reduced stress and less pain)	“How did your goal of 150 minutes this week go? What was your weight change this week?”
Rewards that are contingent on accomplishing goals	“Schedule a massage on months that you get an average of 150 weekly minutes of exercise.”
Self-monitoring of exercise behavior and outcomes of exercise (e.g., weight loss)	“Keep a log of how many minutes you are exercising each day.”
Discussion of past success experiences	“When you were working out a year ago, how did you motivate yourself? What was your plan?”
Prompt feedback on performance	“Your form is very good!”

Provide information about where and when to accomplish an exercise goal	“If you don’t like using your treadmill, you might consider walking outside to get three miles accomplished.”
Provide instruction on how to perform the exercise, including demonstrations	“Let me demonstrate how to do a plank.”
Teach the use of prompts and cues to engage in the behavior	“Put a pair of exercise shoes in the car so they remind you to go to the gym after work.”
Environmental restructuring—encourage removal of unhealthy cues and introduction of healthy cues at home	“Remove the candy dish from the coffee table and put dumbbells by the couch to remind you to do your strength training while you watch TV.”
Behavioral contract—a written agreement with another person about a commitment to a specific goal, indicating the day and time of the goal	“Sign a contract with your husband to walk after dinner on Monday, Tuesday and Thursday.”
Incorporate social support	“Join my Facebook page for extra support from members of the gym. You might also find an exercise buddy!”
Prompt anticipated regret by having the individual think about how he or she will feel later when he or she has not accomplished his or her goal	“How will you feel Monday if you don’t go to the gym on Saturday and Sunday? What will you think to yourself?”
Relapse prevention—asking the individual to think about all the possible things that could happen that could cause a relapse and making a plan to prevent this from occurring	“What do you think could happen this weekend that would prevent you from going for your walks as planned?”
Time management—helping the individual identify gaps in time he or she could use to engage in exercise or how to save time on other tasks to make time for exercise	“Let’s look at your agenda for each day this week and try to identify a ‘window’ for you to fit in a workout.”
Stimulate anticipation of future rewards	“If you kept up this habit of exercise for a few months, what do you think would be different?”

## SUMMARY

Most adults in the U.S. do not achieve the recommended amount of physical activity for good health.<sup>2</sup> Improving exercise adherence involves understanding the individual’s unique barriers and designing a plan to address them. Engaging the individual’s healthcare team is often indicated when medical and psychological issues are present and interfering with exercise adherence. The health and fitness professional is in a unique role to facilitate care for individuals with undiagnosed and/or untreated disorders that may lead to sedentary lifestyle and increased morbidity and mortality. Because people vary in their experience of exercise barriers and have likely experienced shame regarding their difficulties with being more active, the expression of empathy and patience can help to build a

strong, trusting coaching or training relationship, which will ultimately increase the influence of the coach or trainer.<sup>81</sup> The research literature has also identified key facilitators of exercise adherence that can be taken advantage of in exercise coaching or training once identified. Finally, numerous evidence-based behavioral strategies to improve exercise adherence have been identified in the literature, but disconnects between science and practice have slowed dissemination and implementation. Leveraging these techniques in exercise coaching or training and tailoring them to the specific barriers and facilitators experienced by the individual may improve exercise adherence and, consequently, physical and mental health.



## **ABOUT THE AUTHOR**

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