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Promoting Physical Activity as a Lifestyle through Use of Behavioral Change Theories

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Abstract

With the rise of sedentary lifestyles in the United States, an increase in physical activity is needed to combat the consequences of sedentary behavior. Healthcare professionals (HCPs) work regularly with patients struggling with injuries and diseases stemming from inactivity. Research has shown numerous benefits of regular physical activity, yet only half of Americans engage in enough physical activity to be considered active. Theories of behavioral change have been developed to help patients become physically active and maintain activity as part of their lifestyle. The Transtheoretical Model (TTM) and the Social-Cognitive Theory (SCT) are examples of effective models in promoting physical activity by employing techniques to promote behavioral change. These two models will be the focus of the following thesis.

Promoting Physical Activity as a Lifestyle through Use of Behavioral Change Theories

Making a lifestyle change is a process that requires time and commitment on the part of the person adopting such a change. Turning a behavior into a habit that is maintainable usually occurs over a span of time rather than in an instant. People make lifestyle changes for a number of reasons, many of which are health-related. Some are able to maintain the lifestyle change, while others eventually revert to their old habits. When it comes to health issues, breaking one's unhealthy habits or adopting a better lifestyle will have a positive impact on the individual's future health or may prevent him or her from having further complications. Healthcare professionals (HCPs), such as doctors, physical therapists, nurses, and exercise physiologists, have a challenging task of educating their patients and clients about the importance of such changes with the hopes of motivating them to change for the sake of their health and quality of life.

A lifestyle change people may struggle to adopt is one of engaging regularly in physical activity. The increasingly sedentary lifestyle of many Americans has become a growing concern in the United States within the past several years. According to the American College of Sports Medicine (ACSM), in order to be considered "physically active", an individual must participate in physical activity for a duration of at least 30 minutes of moderate-intensity physical activity 5 days a week or at least 20 minutes of vigorous intensity physical activity 3 days of the week (Pescatello, 2014). This should accumulate to at least 150 minutes of moderate-intensity physical activity a week or 75 minutes of vigorous-intensity. The guidelines set by the ACSM are based on extensive research showing this is the minimum amount of exercise to reduce the risk for

cardiovascular disease and provide other health benefits which will be discussed in further detail.

The percentage of American adults, however, meeting this requirement is only 51.6% of the national population, according to the State Indicator Report on Physical Activity published by the Centers for Disease Control in 2014. For purposes of clarification, ACSM has defined physical activity as being “any bodily movement produced by the contraction of skeletal muscles that results in a substantial increase in caloric requirements over resting energy expenditure” (Pescatello, 2014, p. 2). Examples of moderate-intensity activities include walking at a brisk pace, heavy cleaning around the house such as washing windows or vacuuming, mowing the lawn, ballroom dancing, recreational volleyball, etc. Vigorous-intensity activities include hiking, jogging or running, bicycling, playing in a basketball or soccer game, and swimming. While the term physical activity is often used synonymously with exercise in today’s culture, ACSM defines exercise as being a “type of physical activity consisting of planned, structured, and repetitive bodily movements” (Pescatello, 2014, p. 2). Exercising is typically associated with going to a gym for the purpose of becoming more fit. Individuals may be more responsive to engaging regularly in a moderate-intensity physical activity program, rather than undergoing vigorous, high-intensity workouts (Marcus & Forsyth, 2009).

Regular physical activity and exercise have been shown to have many benefits such as reducing the risk of diseases like Type 2 diabetes, coronary heart disease, high blood pressure, stroke, breast cancer, and colon cancer (U.S. Department of Health and Human Services, 2008). Additional benefits include reducing the risk for premature death, losing or maintaining weight, reducing depression, increasing cognitive

functioning in older adults, and improving quality of sleep. Regular physical activity and risk for disease and early mortality have an inverse relationship called a dose-response relationship (Pescatello, 2014). As physical activity and exercise increase, an individual's risk for developing cardiovascular disease, and other aforementioned diseases, decreases. If HCPs are able to motivate their patients to adopt physical activity or exercise as a lifestyle, these individuals will see improvement in their health problems and injuries and experience an overall better quality of life.

Despite the vast research showing the benefits of being physically active, physical therapists and other HCPs involved in rehabilitation oftentimes have difficulty motivating their patients to follow their plan of care (Altmaier, Russell, Kao, Lehmann, & Weinstein, 1993). These plans of care generally involve attending physical therapy sessions and consistently following home exercise programs. Sedentary and obese patients need to develop the motivation to adopt physical activity as a lifestyle in order to see improvement in their condition. Through research over the years, psychologists have developed a number of behavioral change theories to explain the process individuals undergo when making lifestyle changes and the factors influencing them to maintain the changes, even in the face of daily barriers (Linke, Robinson, & Pekmezi, 2014). Two theories that have been supported by successful research are the Transtheoretical Model and the Social-Cognitive Theory. By understanding and utilizing components of these theories of behavioral change, HCPs can help their patients develop the motivation to adopt regular physical activity and exercise as a lifestyle in order to improve their health conditions.

Barriers to Physical Activity

Behavioral change theories including the Transtheoretical Model and the SocialCognitive Theory are designed to address and combat the barriers that may need to be overcome on a daily basis for a patient or client to regularly engage in physical activity or exercise. The factors influencing the barriers between individuals and their participation in physical activity are vast (Patay, Patton, Parker, Fahey, & Sinclair, 2015). Ten of the primary reasons that have been determined to be barriers to physical activity in adults include lack of time, inconvenience, lack of motivation, lack of enjoyment, lack of energy, low self-efficacy, fear of injury, poor self-management skills, social influences, and environmental influences (Sallis & Hovell, 1990). The biggest barrier for individuals to overcome seems to be lack of time. However, in the end, it comes down to whether engaging in physical activity is a priority for the individual or not. HCPs need to be able to help their patients identify the barriers preventing them from engaging in regular physical activity or exercise in order to develop a plan to overcome them.

Theories of Behavioral Change

Transtheoretical Model

The Transtheoretical Model (TTM), or the Stages of Motivational Readiness, was developed by psychologist and professor, James O. Prochaska, during the 1980s (Wilson, 2010). The TTM was originally applied by Prochaska and his colleagues to subjects who were trying to break their smoking habit (Prochaska, DiClemente, & Norcross, 1992). This model is characterized by a number of constructs from several different theories of behavioral change. These constructs include stages of change, processes of change, self-efficacy, temptation, and decisional balance (Fallon, Hausenblas, & Nigg, 2005).

Stages of change. According to the TTM, there are six stages of behavioral change that a person can move through. These stages explain when an individual changes, or in the case of physical activity, when he or she moves towards or away from making regular physical activity a habit (Marcus & Forsyth, 2009). The six stages are pre-contemplation, contemplation, preparation, action, maintenance, and termination. The stages of change need to be thought of as being cyclical as it may take an individual a number of attempts in adopting the lifestyle change of being physically active (Prochaska et al., 1992).

Pre-contemplation. In the pre-contemplation stage patients may not be aware of a negative behavioral pattern or health problem they have, but their family and friends are aware of their condition (Prochaska et al., 1992). People in the pre-contemplation stage may feel pressure from their loved ones to seek professional help for their condition, however, unless they feel the need to make a lifestyle change, they will not persist in seeking treatment. Even individuals who are aware that they need to make a change, such as becoming physically active, are considered to be in pre-contemplation if they do not have the intentions to make any change in the next six months.

Contemplation. Individuals have progressed to the contemplation stage when they are aware they have a health condition that needs to be addressed, and they are considering seeking treatment or taking action to change within the next six months (Prochaska et al., 1992). The key to being in the contemplation stage is that the individuals are genuinely thinking about making a change and are not just aware of their problem. They are weighing the pros and cons of their problem, which in this situation would be negative consequences of not being physically active versus those of becoming

physically active. At this point, individuals may or may not have a plan of action for how they are going to change.

Preparation. During the preparation stage, individuals are making a plan for changing their behavior as well as engaging in that behavior to some extent. In this stage they are combining intention and action (Prochaska et al., 1992). For patients or clients wanting to become more physically active, they have already attempted being active or exercising, however, they are not currently meeting the minimum guidelines for being active as determined by ACSM (Marcus & Forsyth, 2009).

Action. The action stage is where the plan developed during the preparation phase is now being used. However, this plan has been implemented for less than six months. For an action to be considered progress during this stage, the individual must be meeting certain criteria, in this case, meeting the guidelines set by ACSM to be considered physically active. By meeting this criteria, the risk for cardiovascular diseases related to a sedentary lifestyle is decreased (Pescatello, 2014).

Maintenance. The fifth stage, the maintenance stage, is characterized by the patient following his or her plan for more than six months. Following the plan for more than six months demonstrates a greater chance of long-term adherence, a lower chance for relapse, and an increase in self-confidence in maintaining physical activity (Prochaska, 1997). Prochaska used data on temptation and self-efficacy to estimate that an individual will remain in the maintenance stage for six months to five years. It takes five years of being in this stage for the likelihood of relapse to drop below 7%.

Termination. Prochaska (1997) included a termination stage in which the behavior change has become automatic, and it is no longer a source of struggle or difficulty. The concept of the termination stage is that the individual is completely cured

from his or her condition. However, little research has been given to this particular stage due to the fact that 100% self-efficacy in areas such as exercise is not realistic for the majority of people. In reality most will live continuously in the maintenance stage. The focus of this thesis will be on the first five stages of the TTM.

Processes of change. Another key construct of the Transtheoretical Model is the processes individuals use to move from one stage to another, which are categorized as either being cognitive (experiential) or behavioral (Marcus & Forsyth, 2009). These are called processes of change (POC), and they explain how a person is able to move from one stage to the next. Cognitive processes, also called experiential processes, are used in the earlier stages of the TTM such as during the pre-contemplation, contemplation, and preparation stages, and they are employed to change thinking about an activity or behavior (Pescatello, 2014). Once action is initiated, more of the behavioral processes are engaged such as during the action and maintenance stages. There are ten processes that have been determined to be the most influential, five of which are cognitive and the other five are behavioral (Prochaska, 1997).

Table 1

Cognitive Processes

Consciousness raising	Involves increasing awareness or knowledge about the problem of being sedentary, such as the causes, consequences, and possible solutions.
Dramatic relief	Increases emotional reaction of a person towards his or her sedentary lifestyle by listing the negative effects of inactivity and then providing relief by informing the individual of ways to become more active.
Self-reevaluation	Prompts the individual to compare himself or herself in his or her current sedentary and unhealthy state with his or her vision of what life would look like after adopting physical activity and exercise as a lifestyle.

Environmental reevaluation	Encourages the individual to consider the consequences his or her actions have on those around him or her, such as friends and family members.
Self-liberation	Increases individual’s belief that he or she can change by providing more than one option for becoming physically active.

Note. The information in this table has been arranged in chart format for appearance.

The descriptions of the processes are defined in terms of the problem behavior being a sedentary lifestyle. Adapted from “The Transtheoretical Model of Health Behavior Change” by J.O. Prochaska, 1997, *The American Journal of Health Promotion*, 12(1), 38-48.

Table 2

Behavioral Processes

Social liberation	Increases healthy social opportunities for people to engage in physical activity. These opportunities may be the result of public policy change or health promotion.
Counterconditioning	Encourages the individual to use physical activity and exercise as a way of dealing with problem behaviors that might encourage being sedentary such as anxiety, depression, and tiredness.
Stimulus control	Prompts the individual to remove cues that would prevent being physically active while increasing stimuli to engage in physical activity or exercise.
Contingency management	Uses punishment to discourage being sedentary while using rewards to increase physical activity and exercise. Reinforcement through the use of rewards is more effective than the use of punishment.
Helping relationships	Utilizes relationships with others as a source of encouragement and motivation in engaging in physical activity.

Note. The information in this table has been arranged in chart format for appearance.

The descriptions of the processes are defined in terms of the problem behavior being a

sedentary lifestyle. Adapted from “The Transtheoretical Model of Health Behavior Change” by J.O. Prochaska, 1997, *The American Journal of Health Promotion*, 12(1), 38-48.

Physical therapists and other healthcare professionals who are working with patients in the early stages should focus on using the cognitive processes in their treatment plans (Altmaier et al., 1993). Traditional exercise and weight loss programs are typically geared towards individuals already in the preparation stage or beyond (Prochaska, 1997). This explains why patients and clients who are only in stage one or two are labeled as being resistant or unmotivated because the program is not using the appropriate cognitive processes necessary to meet the individuals’ stage of change. Once individuals begin engaging in physical activity or exercise, they must begin employing behavioral processes to continue to progress. These processes are necessary to help individuals move from preparation to action and then from action to maintenance where they will remain if they continue to utilize these strategies successfully. The two types of processes are not exclusive to any one stage, but for patients in the pre-contemplation, contemplation, and preparation stages, the cognitive processes will primarily be used, whereas patients in the action and maintenance stages will mainly be employing behavioral processes.

Additional constructs of the TTM. In addition to the stages of change and processes of change, there are other constructs that influence how people move from one stage to the next. These constructs include self-efficacy, temptation, and decisional balance (Fallon et al., 2005). Self-efficacy is referred to as the confidence a person has to successfully engage in a behavior even in the face of barriers. Increasing self-efficacy is

associated with moving to a higher stage of change. The concept of self-efficacy will be considered in greater detail during the discussion of the Social Cognitive Theory, as it is derived from this theory. Temptation refers to the urge or desire a person has to engage in a problem behavior in the midst of adverse circumstances. Decreasing the temptation to be sedentary will be crucial for increasing regular physical activity. Finally, decisional balance represents the weighing of pros and cons for engaging in a healthy behavior. For patients and clients in the early stages of pre-contemplation and contemplation, the cons of physical activity and exercise are perceived as being greater than the benefits. Some common cons of engaging in physical activity and exercise include being uncomfortable, getting sweaty, taking time away from family and friends, and being exhausted (Marcus & Forsyth, 2009). Independently, the constructs of self-efficacy, temptation, and decisional balance are not strong enough to influence behavior change but should be recognized as having an impact when used in conjunction with one another (AndersonBill, Winett, & Wojcik, 2011).

Social-Cognitive Theory

The Social-Cognitive Theory (SCT) states that behavior change is influenced by the interactions among the environment, personal factors, and the behavior itself (Ehrman, Gordon, Visich, & Keteyian, 2009). The relationship among these interactions is called reciprocal determinism due to the fact that these factors influence each other in a continuous and reversible loop (Linke et al., 2014). The concept of reciprocal determinism is illustrated in Figure 1.

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Figure 1. Reciprocal Determinism. Reprinted from “Applying Psychological Theories to Promote Healthy Lifestyles” by S.E. Linke, C.J. Robinson, D. Pekmezi, 2014, American Journal of Lifestyle Medicine, 8 (1), 4-14.

The Social-Cognitive Theory has had the most impact in influencing the adoption of physical activity as a lifestyle change (Marcus & Forsyth, 2009). It is similar to the TTM in that it utilizes both cognitive and behavioral components to influence behavior change (O’Sullivan & Strauser, 2009). The core construct of the SCT is self-efficacy, however, other constructs of this theory are social support, outcome expectations, and self-regulation (Anderson-Bill et al., 2011). Recent studies indicate that while increasing an individual’s self-efficacy is important for improving physical activity and exercise adherence, it is more effective to do so in conjunction with utilizing the other constructs of the SCT as well.

Self-efficacy. Self-efficacy is defined by psychologist Albert Bandura, who is credited with developing the SCT, as being “a person’s confidence in his or her abilities to perform a specific task” (O’Sullivan & Strauser, 2009, p. 251). Individuals are more likely to attempt performing a certain behavior or action if they believe in their ability to complete it. Research shows that health care professionals involved in rehabilitation, such as physical therapists, should make increasing their patients’ self-efficacy an important goal during treatment (Altmaier et al., 1993). However, even if self-efficacy is high, and

the other constructs of the SCT are low, behavioral change may still be impeded. HCPs, therefore, may need to focus on increasing the use of more than one construct (Linke et al., 2014).

Expectations. Another important construct of the Social-Cognitive Theory is the idea of people having two types of expectations when they are performing a behavior (Bandura, 1977). The first expectation that individuals have is an outcome expectation, which occurs when they believe a certain behavior will lead to a certain outcome. This type of expectancy relies on the individual's knowledge about the behavior. For example, a person may believe that engaging in physical activity will reduce his or her risk for developing type II diabetes, or that exercising regularly will help him or her lose weight.

The other kind of expectancy is called efficacy expectation in which the individual believes that he or she is capable of performing the necessary behavior to achieve the outcome. This type of expectancy is dependent on what the individual believes about him or herself. Bandura (1977) believes that it is this kind of expectancy that promotes behavioral change. Outcome expectations alone are not sufficient motivators because someone may believe that regular physical activity or exercise will have a positive impact on his or her health, but if he does not think that he is capable of becoming physically active long-term, this individual may be unlikely to put effort into becoming active. On the other hand, efficacy expectations will determine the extent to which someone puts effort into being active and the amount of time for which he or she persists in regularly participating in physical activity and exercise, despite difficulties and barriers. The relationship of these two types of expectations with a given behavior and outcome are illustrated in Figure 2.

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<http://psycnet.apa.org/journals/rev/84/2/191.pdf>

Figure 2. The Theoretical Framework. Reprinted from “Self-efficacy: Toward a Unifying Theory of Behavioral Change” by A. Bandura, *Psychological Review*, 84(2), 191-215.

Since increasing an individual’s personal efficacy expectation seems to be more influential in stimulating behavior change than outcome expectations, it is necessary to look at the four sources that affect efficacy expectations. These four sources are performance accomplishments, vicarious experiences, verbal persuasiveness, and emotional arousal (Bandura, 1977). A performance accomplishment occurs when the patient or client himself successfully masters a task or experience. This is considered the most influential source out of the four in increasing an individual’s self-efficacy (O’Sullivan & Strauser, 2009). Verbal persuasiveness takes the form of the individual being convinced by another that he or she is able to accomplish the given task. Vicarious experiences occur when an individual sees the behavior performed with positive consequences. Finally, emotional arousal describes a high level of emotion or anxiety toward a behavior that will influence whether the individual feels that he or she can complete the task successfully (Bandura, 1977). A high level of emotional arousal is associated with decreasing an individual’s efficacy expectation.

The Transtheoretical Model and the Social-Cognitive Theory are both considered “interpersonal theories/models” because they target peoples’ relationships with others as well as their interactions with the environment, as means of driving behavioral change

(Linke et al., 2014, p. 7). Research in the psychology of behavior modification shows that once the environmental events behind the cause of behaviors are understood, then these events can be altered to influence behavior change (Miltenberger, 2016). The TTM and SCT both utilize strategies to help individuals change their thinking and circumstances in order to increase their likelihood to engage in physical activity. Practical guidelines following the constructs of these theories will be further discussed for the use of HCPs when motivating patients or clients to increase regular physical activity and exercise.

Practical Application of Behavioral Change Theories

When making a behavioral change that is meant to be maintained long-term, the patient or client should be encouraged to take small, realistic steps (Crowe, 2014). Trends in diets and exercise programs may elicit initial change in unhealthy, sedentary behavior, but unless the individual is prepared with strategies to combat personal barriers relevant to his or her stage of change, these fads will not develop into long-term behavior change. The use of a variety of behavioral change techniques, which come from the Transtheoretical Model and the Social-Cognitive Theory, provides the support needed to turn regular physical activity into a lifestyle. The techniques employed, however, will vary depending on the patient or client's stage of change. Therefore, a crucial first step in developing a successful plan for increasing physical activity is determining the individual's current stage of change.

Determining Stage of Change

In order for HCPs to assist their patients in moving toward becoming more physically active, they must first determine the patient or client's current stage of change.

The patient's stage will determine which processes of change need to be utilized which will in turn shape the goals the HCP and patient set together. It is important for an individual to not skip stages when applying the Transtheoretical Model (Marcus & Forsyth, 2009). For example, if a person is aware of his or her need to begin participating in physical activity and is considering implementing change, he or she is considered to be in stage two, or the contemplation stage. If this individual was to skip the preparation stage and proceed directly to stage four, the action stage, without an exercise plan or strategies to combat personal barriers, this person will be less likely to continue participating in exercise or physical activity. More than likely, this person will become frustrated and discouraged and begin doubting his or her ability to consistently participate in exercise. More than 50% of individuals who join an exercise program will drop out between three and six months after joining, usually because the program does not match their stage of change (Marcus, Rossi, Selby, Niaura, & Abrams, 1992). An essential key for HCPs helping their patients adopt an active lifestyle is to match appropriate treatment strategies to their patients' current stage of the Stages of Motivational Readiness (Marcus & Forsyth, 2009). Questionnaire 2.1, entitled "Physical Activity Stages of Change", was developed to assist individuals in determining their stage of change (see Appendix A).

Determining Target Processes of Change

After determining the patient's stage of change, the HCP can determine whether cognitive or behavioral processes are needed, or even a combination of the two types. As mentioned earlier, for patients in stages one and two, cognitive processes will primarily be used to target a change in thinking towards being physically active, whereas patients in stages three through five, who are already engaging in some physical activity, will be best

equipped with behavioral processes. Table 3 provides a practical visualization of the stages during which certain processes are utilized compared to other stages (Prochaska, 1997).

Table 3.



Note. Reprinted from “The Transtheoretical Model of Health Behavior Change” by J.O. Prochaska, 1997, *The American Journal of Health Promotion*, 12(1), 38-48.

Another questionnaire is available, “Questionnaire 4.1: Process of Change,” which allows HCPs to determine which processes their patients are currently employing and which ones need to be utilized more (see Appendix B). Patients and clients are recommended to complete this questionnaire every three months to gauge their progress in becoming more physically active (Marcus & Forsyth, 2009). Because more processes of change are utilized by those in higher stages of change, an increase in the score after three months demonstrates that more processes are being used and therefore, the patients or clients are moving towards a higher stage.

In order to score the results of Questionnaire 4.1, the HCP should add together the scores of the four statements related to a single process and divide by four to calculate the average score for that particular process (see Appendix B). Table B1 shows typical scores for each process depending on the stage of change. The scores for the processes in stage five tend to be higher than the other stages. However, for some of the processes, such as being aware of risks and comprehending benefits, the scores are higher in stage

four than in stage five. This is because the use of these cognitive strategies may not have as much of an influence on someone who is maintaining his or her level of activity as opposed to someone who is trying to increase his or her engagement in physical activity. Table B2 is provided to show which question number correlates with which process of change for scoring purposes.

Applying Constructs of the Social Cognitive Theory

A study completed in 2011 measured the constructs of the Social Cognitive Theory in order to determine which had the greatest effect in increasing healthy nutrition and physical activity behaviors among users of a web-based program, the *Web-Based Guide to Health* (Anderson-Bill et al., 2011). The constructs of the SCT that were measured were social support, self-efficacy, outcome expectations, and self-regulation. The results from this study showed that of the four constructs measured, perceived social support and self-regulation had the most influence on the users' nutrition and physical activity behaviors. Self-efficacy also played a significant role, but it did not measure as high as the other two. Outcome expectations scored the lowest and did not seem to cause a significant change in behavior. The researchers concluded that while increasing self-efficacy is important in maintaining healthy behaviors, its effect may be undermined if there is a lack of emphasis placed on enlisting social support and creating self-regulatory strategies such as setting goals, planning, and providing feedback. Strategies for incorporating these constructs into increasing physical activity and exercise will be further discussed.

Enlisting social support. This construct is similar to the TTM's behavioral process of "helping relationships" which utilizes the support of friends and family in becoming physically active and maintaining activity levels. This method can be as

simple as arranging plans to walk with a friend on Monday, Wednesday, and Friday each week for 30 minutes. Not only does this create accountability for the patient or client, it can also act as a positive reinforcer in providing quality time with a friend (Miltenberger, 2016). Participating in group fitness classes at a gym or joining a recreational sports team are also means of enlisting social support while engaging in physical activity that is enjoyable to the patient, depending on their level of fitness and activity interests.

Self-regulatory strategies. These strategies can take the form of setting goals, planning, self-monitoring, and providing positive reinforcement through self-incentives, or rewards. The purpose of these strategies is for the patient to be able to modify the antecedents and consequences of participation in physical activity to make it more favorable and therefore, more likely to occur (Miltenberger, 2016).

Setting goals. Setting goals has become a popular and effective means of promoting change in the health and fitness world. Goal setting from a rehabilitation perspective is defined as a “formal process whereby a rehabilitation professional or team together with the patient and/or their family negotiate goals” (Wade, 2009, p. 291-292). For individuals to be motivated by their goals, they need to have a say in the goals they set for themselves. HCPs can assist them, however, by making sure that their goals are specific to their stage of change, therefore making them more realistic. An acronym that is used to describe setting good, practical goals is the word SMART (Wade, 2009). This acronym has a variation of meanings, but one common form is Specific, Measurable, Attainable, Realistic, and Time-Based. Some variations also include ER to form the acronym SMARTER. Here the E stands for exciting or enjoyable and the R represents recorded, reviewed, or rewarded.

An example of a SMART goal for increasing physical activity during the week would be for the patient or client to aim to walk for 15 minutes during his or her lunch break during the week as well as to walk for another 15 minutes after dinner (Marcus & Forsyth, 2009). By having a SMART goal, the individual is able to determine whether he or she was successful in achieving it because it is objective and can therefore be recorded and measured. HCPs should help their patients develop short-term goals, like the example above, in order to achieve long-term goals. A long-term goal for the patient might be to work up to walking 90 minutes a day, 5 days a week by the end of an 8-week program. ACSM recommends that when initiating an exercise program, increasing the duration or volume of the activity first is preferred, rather than the intensity (Pescatello, 2014). Furthermore, it is suggested that progression involves an increase of 5-10 minutes every 1-2 weeks for the first 4-6 weeks of the program.

Self-monitoring. Self-monitoring used in conjunction with goal-setting can be an effective means of increasing physical activity (Miltnerberger, 2016). This self-regulation strategy works by having the patient or client write down every time he or she engages in physical activity. Frequency, duration, and type of activity or exercise can all be included in the record. Sometimes the act alone of recording one's physical activity can elicit an increase in activity or exercise.

Recent developments in electronic activity monitors have utilized aspects of behavioral change theories, including the SCT, to encourage an increase in physical activity. One study conducted a systematic analysis of 13 popular electronic monitors to compare their use of 93 behavioral change techniques derived from these theories (Lyons, Lewis, Mayrsohn, & Rowland, 2014). All 13 of these devices implemented selfmonitoring, goal-setting, and feedback, while half of them also used social

comparison, social support, and social reward. Three devices that used the most behavioral change techniques were the Fitbit Force, Jawbone Up24, and Nike Fuelband SE.

Another study demonstrated the use of the Fitbit One to increase adherence to physical activity in a group of 25 overweight or obese, post-menopausal women (Cadmus-Bertram, Marcus, Patterson, Parker, & Morey, 2015). Physical activity was measured in minutes per week of moderate to vigorous-intensity exercise, as well as daily step count. During the baseline assessment, participants averaged 5,906 steps per day and 24 minutes per week of accumulated moderate to vigorous-intensity exercise. During weeks 1-4 of the treatment phase, the average step count increased to 7,922 per day and an accumulated activity time of 91 minutes per week. During weeks 5-16, there was a slight, but not significant, decrease in the daily step count and accumulated weekly activity time. The researchers concluded that the participants adhered well to wearing the Fitbit watches and that the devices are a promising means of tracking and monitoring physical activity adherence. However, limitations included the short duration of the study and small sample size. Further research needs to be done in this area.

Positive reinforcement. Because the benefits of engaging in regular physical activity are often not experienced immediately, such as increasing the patient's energy level or losing weight, the use of positive reinforcements, or rewards, can be implemented as a more immediate benefit (Marcus & Forsyth, 2009). The term positive reinforcement refers to the immediate consequences following a particular behavior in order to strengthen the likelihood of the person engaging in the behavior again (Miltenberger, 2016). This idea is similar to the behavioral process of contingency management in the TTM which encourages the use of rewards to increase physical activity and exercise

(Prochaska, 1997). Such rewards can be tangible or intangible. The use of positive reinforcements, however, may be more effective when used in conjunction with social support to avoid the occurrence of short-circuiting the contingency. This occurs when an individual tries to use rewards as a means of motivation but instead takes the reward without participating in physical activity. Having social support will help reduce the likelihood of this happening (Miltenberger, 2016).

Increasing self-efficacy. As mentioned previously, four means of increasing one's self-efficacy are performance accomplishments, verbal persuasiveness, vicarious experiences, and emotional arousal. As performance accomplishments has been shown to have the greatest influence in increasing self-efficacy, this source should receive the most attention (O'Sullivan & Strauser, 2009). Performance accomplishments come about when patients are successful at completing a task or goal, especially the SMART goals they have set. HCPs can enhance performance accomplishments by encouraging clients to participate in tasks or activities that are appropriately challenging to their level of activity and fitness. Participating in activities that are too difficult physically and beyond their efficacy beliefs will lead to the feeling of failure which will reduce levels of self-efficacy for future participation in physical activity or exercise. Additionally, accomplishing tasks that are not considered challenging is unlikely to increase an individual's self-efficacy. According to authors O'Sullivan and Strauser (2009, p. 256), "The optimal level of task difficulty to improve levels of efficacy should be challenging but not beyond the capabilities of the individual with effort exerted."

Conclusion

Making physical activity and exercise a lifestyle is a struggle that many Americans face. Despite the numerous barriers, long-term change is possible to maintain.

As healthcare professionals typically work with patients who are in the precontemplation, contemplation, and preparation stages of the Transtheoretical Model, motivating patients or clients to engage in a sufficient amount of physical activity or exercise to reduce the risk of disease and early mortality is a challenge they deal with on a regular basis. HCPs can be better equipped to assist these patients by understanding and applying the constructions of the TTM and SCT, both of which have been shown to increase adherence to physical activity and exercise.

The key to developing a plan for physical activity or exercise adherence is to match the patient or client's stage of change with the appropriate processes of change. Using a variety of behavioral change techniques such as enlisting social support, goal setting, self-monitoring, using positive reinforcements, and increasing self-efficacy will increase the patient's ability to incorporate physical activity into daily life. Just as with any long-term change, small steps need to be taken to ensure that regular physical activity can be maintained. While barriers will need to be overcome on a regular basis, by having HCPs help develop a well-thought out, individualized plan of care, patients and clients can be set up for success in becoming physically active for a lifetime.

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Appendix A

Questionnaire 2.1

Physical Activity Stages of Change

For each of the following questions, please circle Yes or No. Please be sure to read the questions carefully.

Physical activity or exercise includes activities such as walking briskly, jogging, bicycling, swimming, or any other activity in which the exertion is at least as intense as these activities.

	No	Yes
1. I am currently physically active	0	1
2. I intend to become more physically active in the next 6 months	0	1
For activity to be regular, it must add up to a total of 30 minutes or more per day and be done at least 5 days per week. For example, you could take one 30-minute walk or take three 10-minute walks for a daily total of 30 minutes.		
	No	Yes
3. I currently engage in regular physical activity	0	1
4. I have been regularly physically active for the past 6 months	0	1

Scoring Algorithm

If (question 1=0 and question 2=0), then you are at stage 1.

If (question 1=0 and question 2=1), then you are at stage 2.

If (question 1=1 and question 3=0), then you are at stage 3.

If (question 1=1, question 3=1, and question 4=0), then you are at stage 4.

If (question 1=1, question 3=1, and question 4=1), then you are at stage 5.

Appendix B

Questionnaire 4.1 Process of Change

Physical activity or exercise includes activities such as walking briskly, jogging, bicycling, swimming, and any other activity in which the exertion is at least as intense as these activities.

The following experiences can affect the exercise habits of some people. Think of any similar behaviors you may currently have or have had during the **past month**. Then rate how frequently the behavior occurs. Please circle the number that best describes your answer for each experience.

How frequently does this occur?

1 = never

2 = seldom

3 = occasionally

4 = often

5 = repeatedly

- | | |
|---|-----------|
| 1. Instead of remaining inactive, I engage in some physical activity | 1 2 3 4 5 |
| 2. I tell myself I am able to be physically active if I want to | 1 2 3 4 5 |
| 3. I put things around my home to remind me to be physically active | 1 2 3 4 5 |
| 4. I tell myself that if I try hard enough, I can be physically active | 1 2 3 4 5 |
| 5. I recall information people have personally given me on the
benefits of physical activity | 1 2 3 4 5 |
| 6. I make commitments to be physically active | 1 2 3 4 5 |
| 7. I reward myself when I am physically active | 1 2 3 4 5 |
| 8. I think about information from articles and advertisements
on how to make physical activity a regular part of my life | 1 2 3 4 5 |
| 9. I keep things around my place of work that remind me to be physically active | 1 2 3 4 5 |
| 10. I find society changing in ways that make it easier to be physically active | 1 2 3 4 5 |

- 11.** Warnings about the health hazards of inactivity affect me emotionally 1 2 3 4 5
- 12.** Dramatic portrayals of the evils of inactivity affect me emotionally 1 2 3 4 5
- 13.** I react emotionally to warnings about an inactive lifestyles 1 2 3 4 5
- 14.** I worry that inactivity can be harmful to my body 1 2 3 4 5
- 15.** I am considering the idea that regular physical activity would make me a healthier, happier person to be around 1 2 3 4 5
- 16.** I have someone I can depend on when I am having problems with physical activity 1 2 3 4 5
- 17.** I read articles about physical activity in an attempt to learn more about it 1 2 3 4 5
- 18.** I try to set realistic physical activity goals for myself rather than set myself up for failure by expecting too much 1 2 3 4 5
- 19.** I have a healthy friend who encourages me to be physically active when I don't feel up to it 1 2 3 4 5
- 20.** When I am physically active, I tell myself that I am being good to myself by taking care of my body 1 2 3 4 5
- 21.** The time I spend being physically active is my special time to relax and recover from the day's worries, not a task to get out of the way 1 2 3 4 5
- 22.** I am aware of more and more people encouraging me to be physically active these days 1 2 3 4 5
- 23.** I do something nice for myself for making efforts to be more physically active 1 2 3 4 5
- 24.** I have someone who points out my rationalizations

for not being physically active	1 2 3 4 5
25. I have someone who provides feedback about my physical activity	1 2 3 4 5
26. I remove things that contribute to my inactivity	1 2 3 4 5
27. I am the only one responsible for my health, and only I can decide whether or not I will be physically active	1 2 3 4 5
28. I look for information related to physical activity	1 2 3 4 5
29. I avoid spending long periods of time in environments that promote inactivity	1 2 3 4 5
30. I feel that I would be a better role model for other if I were regularly physically active	1 2 3 4 5
31. I think about the type of person I would be if I were physically active	1 2 3 4 5
32. I notice that more business are encouraging their employees to be physically active by offering fitness courses and time off to work out	1 2 3 4 5
33. I wonder how my inactivity affects those people who are close to me	1 2 3 4 5
34. I realize that I might be able to influence others to be healthier if I would be more physically active	1 2 3 4 5
35. I get frustrated with myself when I am not physically active	1 2 3 4 5
36. I am aware that many health clubs now provide babysitting services to their members	1 2 3 4 5
37. Some of my close friends might be more physically active if I were	1 2 3 4 5
38. I consider the fact that I would feel more confident in myself if I were regularly physically active	1 2 3 4 5
39. When I feel tired, I make myself be physically active anyway because I know I will feel better afterwards	1 2 3 4 5
40. When I am tense, I find physical activity a great way to relieve my worries	1 2 3 4 5

Table B1.

Average Scores by Stage for the Processes of Change Questionnaire

Process	Stage				
	1	2	3	4	5
Increasing knowledge	1.88	2.57	2.76	3.11	2.99
Being aware of risks	1.92	2.41	2.26	2.72	2.46
Caring about consequences to others	1.82	2.43	2.46	2.74	2.47
Comprehending benefits	2.14	3.13	3.22	3.66	3.28
Increasing healthy alternatives	2.14	2.55	2.75	2.81	2.79
Substituting alternatives	1.71	2.24	2.72	3.35	3.55
Enlisting social support	1.78	2.25	2.42	2.80	2.64
Rewarding oneself	1.52	2.25	2.54	2.99	3.01
Committing oneself	2.08	2.94	3.17	3.83	3.68
Reminding oneself	1.42	1.85	2.02	2.30	2.20

Note. Reprinted from *Motivating people to be physically active* (p. 40) by B. Marcus & L.

Forsyth, 2009, Champaign, IL: Human Kinetics.

Table B2.

Grouping Related Items on the Processes of Change Questionnaire

Process	Items
Increasing knowledge	5, 8, 17, 28
Being aware of risks	11, 12, 13, 14
Caring about consequences to others	30, 33, 34, 37
Comprehending benefits	15, 31, 35, 38
Increasing healthy alternatives	10, 22, 32, 36
Substituting alternatives	1, 21, 39, 40
Enlisting social support	16, 19, 24, 25
Rewarding oneself	7, 18, 20, 23
Committing oneself	2, 4, 6, 27
Reminding oneself	3, 9, 26, 29

Note. Reprinted from *Motivating people to be physically active* (p. 40) by B. Marcus & L.

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