



Introduction

Individuals with serious mental health conditions experience higher rates of obesity and metabolic syndrome than the general population. This likelihood of obesity is anywhere from 1.2-3.5 times higher in this population (De Hert, et al., 2011). While medication side effects certainly contribute to this, there are a number of modifiable behavioral risk factors that should be addressed. One of those modifiable risk factors is physical inactivity. Individuals with serious mental health conditions are less likely to meet the physical activity guidelines and spend a significant portion of their day in sedentary behavior (Brown, Wang, & Safran, 2005; Chuang, Mansell, & Patten, 2008; De Hert et al., 2011; Lindamer et al., 2008; Vancampfort, Probst, Knapen, Carraro, & De Hert, 2012). Some research indicates that individuals with schizophrenia spend up to 20 hours/day in sleep or sedentary behavior (Roick et al., 2007). In fact, only 12% of individuals with PD participate in moderate physical activity, a percentage that is more than doubled (30%) in the general population (Davidson et al., 2001). While recreation and leisure participation is reported at similar percentages, leisure engagement is often more passive, and as such, more sedentary (Krupa, McLean, Eastabrook, Bonham, & Baksh, 2003).

Extensive research has been conducted to document the physical and psychological benefits of exercise in both the general population and among individuals with serious mental health conditions. Research has found that supervised aerobic exercise programs lasting at least 8 weeks, three times per week for a minimum of 30 minutes are likely to yield beneficial results for individuals with depression (Perraton, Kumar, & Machotka, 2010). These recommendations represent the minimum level of structured physical activity recommendation. Other guidelines suggest exercise programs that last 10-14 weeks with sessions that are 45-60 minutes long, three times per week or a total 210 minutes per week spread across the week, with no more than two consecutive inactive days (Stanton & Reaburn, 2014). This information sheet provides a summary of some of the physical and mental health benefits of participating in physical activity. While the majority of the articles reviewed used agency-based exercise interventions, there are likely similar benefits from increased independent participation. While a number of articles are reviewed, this is not an extensive list of the exercise interventions that have been conducted with individuals with serious mental health conditions.

Defining Physical Activity

Activity levels are typically divided into sedentary, light, moderate, and vigorous physical activity. Table one provides a list of activities divided by their physical intensity level.

Sedentary activities are those that require little to no energy expenditure, and often occur when an individual is in a seated or reclined position (Owen, Sparling, Healy, Dunstan, & Matthews, 2010; Pate, O'Neill, & Lobelo, 2008). Recent research indicates the independent effect sedentary behavior has on health risk factors, suggesting the importance of sedentary behavior as an independent intervention area (Hamilton, Healy, Dunstan, Zderic, & Owen, 2008; Owen et al., 2010; Pate et al., 2008; Tremblay, Colley, Saunders, Healy, & Owen, 2010).

Light activities are those that require between 1.6 and 2.9 METs. Light activity may be purposefully acquired (e.g., walking for pleasure) or incidental (e.g., walking for transportation). Light activity accumulated across one's day is significantly related to total energy expenditure (Pate et al., 2008). Engagement in light activity levels has both physical (Ross & McGuire, 2011) and mental health (Sieverdes et al., 2012) benefits.

Moderate-Vigorous physical activities (MVPA) are those that expend the most amount of energy. According to the Department of Health and Human Services, someone engaging in a moderate activity can often talk, but not sing during the activity. If he or she is engaging in vigorous activities, an individual will likely be able to only say a few words before pausing to take a breath.

Table 1. Activities by intensity level

Sedentary	Light	Moderate	Vigorous
Sleeping	Washing dishes	Walking up/down stairs (normal pace)	Jogging
Watching TV	Shopping	Walking moderate/brisk pace	Running
Reading	Putting away groceries	Golf	Playing basketball
Sitting & Writing	Driving	Frisbee	Playing handball
Sitting & listening to music	Walking at a slow pace	Shooting basketballs	Jumping rope
Using a computer	Billiards	Table tennis/ping pong	Sports that involve running
	Darts	Vacuuming	
		Sweeping	

Physical Activity Guidelines

The Department of Health and Human Services (DHHS, 2008) has identified recommended levels of physical activity for adults. Participation in physical activity at or above this recommended level is when individuals will start to see health benefits from participation.

Weekly recommendations include both aerobic activity and muscle strengthening activities. The weekly recommendations are as follows:

- 2 hours and 30 minutes (150 minutes) of moderate intensity activity
OR
- 1 hour and 15 minutes (75 minutes) of vigorous intensity activity
OR
- An equivalent mix of moderate and vigorous activity
AND
- A minimum of two days of muscle strengthening activities

Aerobic activity includes those activities that increase your heart rate. This may include traditional exercise or even housekeeping activities such as vacuuming or sweeping. In order to have activities count towards the total minutes, individuals should strive for participating in activities that last at least 10 minutes.

Muscle strengthening activities are often not thought of when trying to lose weight. These types of activities may not contribute to weight loss, however, they can help ensure body fat is lost, not muscle mass. These types of activities can increase bone and muscle strength. Muscle strengthening activities include traditional weight training, which is often done at a gym where weights are available, yoga, gardening, carrying heavy objects, and calisthenics (using one's body as weight), among others.

Benefits of Physical Activity

A number of research studies that utilized physical activity as an intervention were reviewed to demonstrate the potential benefits of physical activity for individuals with serious mental health conditions. Reviewed articles were conducted within the last 10 years; were presented in English; and implemented with individuals diagnosed with a serious mental health conditions.

Types of Physical Activity Interventions

Interventions utilizing physical activity were diverse in nature. The most frequently identified activities were exercise (Hutchinson, 2005; Knubben et al., 2007; Koch, Morlinghaus, & Fuchs, 2007; Legrand & Heuze, 2007; Shahidi et al., 2010; Vancampfort et al., 2011) and walking (Lee, Kane, Brar, & Sereika, 2014; McCaffrey, Liehr, Gregersen, & Nishioka, 2011; Ng, Dodd, & Berk, 2007).

Walking Interventions

A number of research studies utilized walking as the primary intervention. In addition to the reviewed studies, an additional study was included that summarizes the effects of walking interventions (Soundy, Muhamed, Stubbs, Probst, & Vancampfort, 2014). This review indicated that while study participants lost weight following a walking intervention, the weight loss failed to reach clinical significance (e.g., 5-10% of body weight). Agency-based walking programs had

issues with low attendance; however, participants were intrinsically motivated to participate in walking.

One program was a voluntary walking program for individuals admitted to an in-patient facility (Ng et al., 2007). Individuals were invited to walk for 40 minutes on all weekdays. A second walking intervention (McCaffrey et al., 2011) occurred in a natural environment, in either an independent walking program or a guided walking program. Participants in the independent program met two times per week and walked independently in the garden for 1-2 hours at a time. Participants in the guided program met for a similar amount of time, but were led through the gardens using guided imagery. Participants were prompted to reflect on nature and the gardens. The final walking intervention study used a telephone delivered physical activity intervention to promote engagement in 30 minutes of walking a day (Lee et al., 2014). At the beginning of the intervention, participants set individualized walking goals and learned strategies to self-monitor walking through the use of a pedometer and physical activity log. Additionally, participants received weekly phone calls over an 8-week period to discuss goals, goal attainment, strategies to overcome barriers, and encourage continued engagement.

Benefits of Walking

Two of the studies (McCaffrey et al., 2011; Ng et al., 2007) reviewed the mental health benefits of walking, which included reduced symptoms of depression, anxiety, and stress. A summary of these findings is identified in Table 2.

Table 2. Mental Health Benefits of Walking Interventions

- Reduced symptoms of depression (McCaffrey, Liehr, Gregersen, & Nishioka, 2011; Ng, Dodd, & Berk, 2007)
- Reduced anxiety (Ng, Dodd, & Berk, 2007)
- Reduced stress (Ng, Dodd, & Berk, 2007)
- Increased positive emotions (McCaffrey, Liehr, Gregersen, & Nishioka, 2011)

Participants in the telephone-delivered intervention did not experience improvements in physical health, although they did experience a significant increase in physical activity levels (Lee et al., 2014). This may, in part, be due to the comparatively short (8-week) evaluation period and the small sample in the experimental group (n=8). The other interventions did not indicate the physical health benefits of walking; however, this information can be gleaned from physical activity literature among the general population. Typically, walking falls into either light or moderate intensity levels. As noted, these levels of activity play a significant role in replacing sedentary behavior and account for a significant amount of an individual's daily energy expenditure. Table three provides a summary of the physical health benefits of walking.

Table 3. Physical Benefits of Walking (Hart, 2009)

- | | |
|------------------------------|---------------------------------------|
| • Decreases weight | • Reduced likelihood of stroke |
| • Decreases BMI | • Reduced occurrence of heart disease |
| • Decreases risk of diabetes | • Strengthen bones |

Supporting Walking Goals

Walking is a great physical activity, because it requires very few resources to participate. However, simply telling someone to walk more may not lead to lasting behavioral change. Because of the attendance issues identified, it is important to encourage participants to integrate walking into one's daily life without relying on a walking group or external resources (Soundy et al., 2014). Table 4 provides recommendations for supporting an individual to increase walking. You may also want to refer to the provider fact sheets by following links: <http://tucollaborative.org/wp-content/uploads/2015/06/Walking-Provider-factsheet.pdf> <http://tucollaborative.org/wp-content/uploads/2015/06/Walking-Consumer-factsheet.pdf>

Table 4. Supporting Walking Goals

Technique	Description
Set & Monitor Goals	Setting individualized goals will help ensure success. For individuals who are inactive, 10-minute walks, 3 times per day may be more achievable. As individuals become more comfortable with walking, these goals can increase. Develop strategies for monitoring goals, which may include keeping weekly track of activities, documenting
Share Goals	Communicating goals with mental health providers, family members, and friends will help keep individuals accountable for their activities.
Be Safe	Walking is a low-impact activity that rarely results in injury. However, it is important to walk in a safe environment. Walk during daylight hours and in designated walking areas (e.g., parks, sidewalks, walking trails); walk with a friend; walk in familiar places.
Be Comfortable	Walking doesn't require a lot of equipment to be successful, but it is important to be comfortable. Choose shoes that fit and are comfortable to walk in; wear clothing that is appropriate for the weather (i.e., layers in the winter, light clothing in the summer)
Invite a Friend	Walking with a friend or family member will help individuals to stay motivated.

Exercise Interventions

A number of the reviewed research studies utilized a more traditional exercise-based intervention to address mental health symptoms. Table 10 provides a brief description of the interventions used. A professional facilitated the majority of these intervention programs. As was expected, the majority of the interventions were group-based (Koch et al., 2007; Voruganti et al., 2006). One study focused only on independent activities (Gonzalez et al., 2010) and two used a combination of group-facilitated and independent exercise participation (Forsberg et al., 2010; Van Citters et al., 2010). Finally, only one study directly compared the effects of a group-based intervention to an independent exercise program. (Legrand & Heuze, 2007).

Sessions ranged from 20-60 minutes, with the majority lasting 30 minutes. The length of programs varied, with some single session implementation, two lasting four months, and two lasting 9 months or more. Based on these programs, it is difficult to make best practices recommendation on intervention duration. However, one should consider how long it takes to adopt physical activity behaviors and yield physical health benefits. Programs lasting three months or longer are more likely to yield sustained behavioral change and also have the potential to impact physical health outcomes. Table 5 provides a description of the interventions reviewed.

Table 5. Description of exercise-based interventions

Intervention Description	Frequency	Duration
Sessions conducted in a fitness room at a university. Participants chose from stationary bicycles, stair-climbing machines, and treadmills. Participants were taught to monitor their heart rates, and exercised within a predetermined heart rate range. The goal for participation was to progress to 30 minutes of cardiovascular exercise with defined warm-up and cool-down periods (Hutchinson, 2005).	45 minute sessions, 3 times per week	20 weeks
Lifestyle intervention rotating between nutrition and physical activity sessions. Physical activity sessions provided opportunities for individual and group exercise (Forsberg et al., 2010).	2 hour sessions, 2 times per week	12 months, 35-39 sessions
In SHAPE health promotion program where participants were introduced to a health mentor, a certified fitness trainer, who aided individuals with goal setting, motivation, and encouraged healthy eating. Participants also had access to a dietician, free access to a community-based fitness facility, and received rewards for goal attainment. The project also	Weekly meetings with the health mentor; Monthly weight management group; Independent	9 months

Intervention Description	Frequency	Duration
utilized group motivational “celebrations.” (Van Citters et al., 2010)	exercise (45-60 minutes)	
Movement (control): Participants rode a stationary bicycle until a target heart rate was reached (approximately 120 BPM). (Koch et al., 2007)	20-30 minutes	1 session
Endurance Exercise: interval treadmill walking workout, where participants walked 5 times for 3 minutes at 80% max heart-rate. Participants walked for 3 minutes at half speed between workloads.	30 minute sessions, Daily	10 days
Placebo Exercise (control): Light stretching and relaxation exercises. (Knubben et al., 2007)		
Low-Frequency Exercise (control): Independent participation in brisk walking or stationary bicycling	30 minutes, 1 day per week	8 weeks
High-Frequency Exercise: Supervised, independent participation in treadmill walking/jogging, stationary bicycle, or rowing machine	30 minutes, 3-5 days per week	
High-Frequency + Group: Same as high-frequency exercise, plus group cohesion activities (team shirts, group encouragement, group goals) (Legrand & Heuze, 2007)	30 minutes, 3-5 days per week	
Aerobic Group Exercise (control): Jogging and light stretching with 5 minutes of cool-down (Shahidi et al., 2010)	30 minutes	10 Sessions

Benefits of Exercise

The authors in these studies evaluated the mental health benefits of exercise participation. After participation in the associated exercise program, individuals experienced significant reductions in depressive symptoms (Hutchinson, 2005; Knubben et al., 2007; Legrand & Heuze, 2007; Van Citters et al., 2010) and stress and anxiety (Van Campfort et al., 2011). Increases were found in global functioning and sense of coherence (Forsberg et al., 2010) and positive well-being (Van Campfort et al., 2011) and quality of life (Hutchinson et al., 2005). Physical health benefits included an increase in physical activity levels (Van Citters et al., 2010) and improvements in cardiovascular fitness (Hutchinson, 2005) and exercise tolerance (Hutchinson 2005).

These studies varied in terms of agency location. Some of the interventions were in inpatient facilities, while others recruited directly from the community. This likely has an impact on program fidelity and should be taken into consideration when designing any exercise program. Further, while the majority of these programs utilized a structured, group approach, there are

still implications for supporting independent engagement or for promoting engagement in community-based group exercise programs. Legrang and Hueze (2007) found that both individual and group-based interventions were effective, suggesting a role for both strategies. Exercise programs are more successful if they include opportunities for individualized programming and consumer choice are more likely to yield successful results (Roberts & Bailey, 2011). If interested in beginning an exercise program of your own or supporting exercise goals as a mental health professional, the following recommendations may be useful.

Promoting Exercise

There are similar strategies providers might use to support someone with exercise goals. Table six provides a summary of steps a provider might use to support exercise goals.

Specific recommended activities might include:

- Engage in a weekly, 1-hour session or class during the first month that consists of walking, jogging, standing and seated exercises. Continue exercises through months 2-4 by completing self-directed exercise at home or independently in the community.
- For 3 weeks, engage in facilitated exercise sessions or classes consisting of brisk walking, jogging, standing/seated exercises, and relaxation. Do this for 1 hour, 5 times per week (M-F).
- 10 Day workout: 30 minutes participate in endurance exercises, start out with an interval treadmill workout walking 5 times for 3 minutes at 80% max heart-rate. Progress to walking for 3 minutes at half speed between workloads. Follow this with light stretching and relaxation exercises.
- 8 week work out: In 30 minute sessions, 3-5 times per week engage in high-frequency exercise such as treadmill walking/jogging, stationary bicycle, or rowing machine independently or with a group.

Table 6. Recommendations for Supporting Exercise

Recommendation	Description
Set & Monitor Goals	Set individual goals for exercise. Goals should be staged to encourage success. Consider the number of times per week that can realistically be accomplished and the amount of time for each session. Develop strategies to monitor goals. Monitoring can be a source of motivation and encouragement.
Share Goals	Communicating goals with mental health providers, family members, and friends will help keep individuals accountable for their activities.
Identify Barriers	Everyone experiences unique barriers that may prevent participation. These may be financial, transportation, motivation, or even attitudes

Recommendation	Description
	about exercise. Identifying these barriers is an important step to overcoming them.
Identify Facilitators	Beyond barriers, it's important to recognize the things and/or people that help ensure success. Facilitators may be in direct response to barriers or they may simply be an internal resource that helps navigating barriers easier.
Focus on interest	Many people view exercise as a chore or simply something that has to be done. By choosing an activity that is personally enjoyable, individuals are more likely to enjoy and sustain participation.
Don't get discouraged!	Beginning an exercise program can be difficult! Use every success as a motivation to stay engaged. When setbacks occur, re-evaluate barriers and facilitators and consider additional strategies to facilitate success.

Additional recommendations for participation in community-based exercise can be found in the provider fact sheets by following this link:

<http://tucollaborative.org/wp-content/uploads/2015/06/Exercise-Provider-factsheet-FINAL.pdf>

Summary

Physical activity should be a part of everyone's life! There are both physical and mental health benefits. Supporting consumers to engage in meaningful physical activity is more likely to lead to sustained change and lasting health benefits, than simply providing exercise groups. Even though the majority of the research is based on facilitated groups, providers can pull key findings from the research and tailor it to meet the needs of individual consumers.

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