



Improving the Physical Health of People with Serious Mental Illness: A Systematic Review of Lifestyle Interventions

**A Report from the New York State Center of Excellence for Cultural Competence
at the New York State Psychiatric Institute**

Compared to persons in the general population, individuals with serious mental illness (SMI) on average, die 25 years younger, largely due to preventable health conditions (Parks et al., 2006). These conditions often arise because of lack of exercise, smoking, poor diets, and medication side effects, giving way to such ailments as cardiovascular disease, type 2 diabetes, hypertension, and liver disease (Must et al., 1999). The promotion of healthy lifestyles and wellness among people with SMI is an integral part of the recovery process (Silverstein et al., 2008). A critical step to improving the physical health of adults with SMI is to develop and implement effective, culturally appropriate, and sustainable lifestyle interventions. These interventions are structured approaches that help people engage in physical activity, manage their weight, eat a more balanced and healthier diet, and engage in health promotion activities.

Given the unmet health needs of people with SMI, we performed a systematic literature review to: 1) examine the current state of the literature in the United States (U.S.) examining lifestyle interventions for adults living with SMI; 2) summarize interventions strategies; 3) examine health outcomes; and 4) evaluate the inclusion

of racial and ethnic minority groups in these studies and the cultural and linguistic adaptations used in these interventions. Our search began with probes of the Medline, PsychInfo, PubMed, and Cochrane Collaboration databases for lifestyle interventions studies in adults with SMI conducted in the U. S. and published between January 1980 and July 2009. We then performed additional manual searches of the reference sections of articles, book chapters, and government reports to identify overlooked articles.

Lifestyle interventions that combine exercise, dietary counseling, and health promotion show promise in helping adults with serious mental illness lose weight and reduce some risk factors for cardiovascular disease.

What is the state of the literature?

Twenty-two eligible studies were located and reviewed. Twelve studies (54.6%) restricted their sample to individuals with schizophrenia or schizoaffective disorders (Aquila et al., 2000; Ball et al., 2001; Beebe et al., 2005; Brar et al., 2005; Centorrino et al., 2006; Jean-Baptiste et al., 2007; Littrell et al., 2003; McKibbin et al., 2006; Menza

The majority of studies were mostly single-site efficacy trials with small samples.

et al., 2004; Vreeland et al., 2003; Weber et al., 2008; Weber et al., 2006). The other ten studies included other diagnoses of SMI, such as major depression, bipolar disorders, and anxiety

disorders, among others (Brown et al., 2006; Chafetz et al., 2008; Hutchinson et al., 1999; Kalarchian et al., 2005; McDevitt et al., 2006; Pelletier et al., 2005; Richardson et al., 2005; Rotatori et al., 1980; Skrinar et al., 2005; Wirshing et al., 2006). Intervention sites included a range of treatment settings, such as inpatient units, day treatment programs, outpatient clinics, residential facilities, clubhouses, and vocational agencies. Treatment retention rates ranged from as low as 31% to as high as a 100% with a mean of 69.7% (sd = 17.3%). A range of methodologies were found. Eight studies (36.4%) utilized a single group, pre-post design. Five studies (22.7%) used quasi-experimental designs that compared a treatment condition with a usual care or waitlist group.

Nine studies (40.9%) were randomized controlled trials (RCT). Overall, the majority of studies had small samples ranging from 8 to 72 participants, with only one study recruiting 309 participants, and most were single-site, efficacy trials.

Characteristics of Lifestyle Interventions

Across studies, interventions' goals were to enhance individuals' knowledge of nutrition, physical activity, and general health promotion, impart skills regarding healthy eating habits, weight management, and exercise, and provide support for sustaining lifestyle behavioral changes. All used group or a combination of group and individual sessions to deliver the intervention. Interventions were delivered by a range of staff including registered nurses, exercise physiologists, registered dietitians, trained fitness instructors, case managers, and master's- and doctoral-level healthcare practitioners.

All interventions provided general information about diet, exercise, and health promotion. Interventions that focused on dietary practices included the following strategies: teaching participants how to: read food labels and count calories, keep a food diary, practice portion control and meal planning, eat more slowly, increase intake of fruits, vegetables, water and diet sodas, and decrease consumption of foods high in fat and sugar. Several interventions incorporated more action-oriented approaches to demonstrate and enhance dietary skills, such as grocery store visits (Centorrino et al., 2005; Jean-Baptiste et al., 2007), and cooking demonstrations (Jean-Baptiste et al., 2007).

All interventions were informed and adapted from existing lifestyle interventions originally developed and used in the general population (e.g., Diabetes Prevention Program, Solutions for Wellness, Weight Watchers). Interventions that incorporated exercise elements included simple warm-up and stretching exercises, aerobic exercises (e.g., walking, riding a stationary bike), and individualized fitness training. The physical activity goal across interventions was to gradually increase physical activity up to 30 to 45 minutes 3 to 5 times a week. Most interventions gave participants pedometers and/or heart rate monitors to monitor physical activity. A few interventions taught participants how to read their pulse. Most interventions incorporated behavioral strategies including goal setting, feedback, skills training, problem solving, social support, motivational counseling, stress management, relapse prevention, assertiveness training, rewards/token reinforcements, stimulus control, and risk/benefit comparisons.

The following teaching techniques were used to address the motivational impairment and cognitive deficits associated with SMI: simplifying handout materials and printing them in large font, using educational games, repetition of lessons and modules, frequent homework or quizzes, reading aloud, and integrating mnemonic aides and visual materials.

Do lifestyle interventions help adults with SMI lose weight?

Given that obesity is a serious problem among people living with serious psychiatric disorders, weight loss is an important health outcome for this population. Ten of the 18 studies that reported weight loss findings found statistically significant reductions in weight associated with receiving a structured lifestyle intervention. Average weight losses by treatment duration were 3.3 lbs for 8-10 week interventions, 5.3 lbs for 12-14 week interventions, 4.4 lbs for 16-18 week interventions, 8.2 lbs for 24-48 week interventions, and 4.0 lbs for 52 week interventions. The average weight loss across these ten studies was 5.1 lbs. This average falls below the mean weight loss reported in lifestyle interventions tested in the general population which recent meta-analyses place between 8 and 11 lbs (Douketis, et al., 2005; Franz et al., 2007). Studies in our review with treatments between 24 and 48 weeks (Centorrino et al., 2006; McKibbin et al., 2006; Menza et al., 2004; Kalarchian et al., 2005) were the only ones to mirror the findings from these meta-analyses and achieved weight loss outcomes that averaged 8.2 lbs. This finding suggests that treatment duration may be an important factor that can help maximize the weight loss benefits of lifestyle interventions for individuals with SMI.

Ten of the eighteen studies that reported weight loss findings found statistically significant reductions in weight associated with receiving a structured lifestyle intervention with treatment duration surfacing as a key factor in weight lost.

Are lifestyle interventions for adults with SMI good for the heart?

Common cardiovascular risk factors found among individuals living with SMI and linked to premature mortality include hypertension, high cholesterol, hyperglycemia, and central obesity. Six of the 12 studies that examined the benefits lifestyle interventions have on these cardiovascular risk factors found statistically significant findings (Brar et al., 2005; Centorrino et al., 2006; Jean-Baptiste et al., 2007; McKibbin et al., 2006; Menza et al., 2004; Brown et al., 2006). These studies reported positive effects on systolic and diastolic blood pressure, blood glucose levels, triglycerides, and/or central obesity. Even though these were secondary outcomes and only a limited number of studies explored these effects, these findings seem

Lifestyle interventions show promise in reducing cardiovascular risk factors in people with SMI.

promising as improvement in these risk factors may exert a bigger health benefit than weight loss (Lee et al., 2008) in reducing risks for cardiovascular disease.

Inclusion of Racial/Ethnic Minorities and Cultural Adaptations

Our findings clearly show a serious under-representation of racial and ethnic minorities in the studies reviewed, particularly for Hispanic, Asian, and non-English speaking populations in the U. S.

There is a serious under-representation of racial and ethnic minorities in lifestyle intervention studies among people with SMI and a lack of attention to cultural and linguistic factors in this area of research.

Thirteen studies (59.0%) reported the racial and/or ethnic makeup of their sample. The total sample size across these 13 studies was 700 wherein 346 (49.7%) were non-Hispanic whites, 183 (26.1%) were African Americans, 45 (6.4%) were Hispanics, 29 (4.1%) were Asians, and 97 (13.9%) were of other race/ethnic groups. There is also a true neglect of cultural and linguistic issues within this literature. Only one study - a case report of 8 Spanish-speaking Latino patients - explicitly adapted the Diabetes Prevention Program (DPP; Knowler et al., 2002) for these minority patients (Weber et al., 2008). This was the only study to include non-English speaking participants. Cultural adaptations by Weber and colleagues (2008) entailed changing the format of the intervention from individual to group sessions to increase socialization and enhance the usability of the intervention in community mental health settings with limited resources, shortening the intervention from 16 to 8 weeks, delivering the intervention in Spanish, and modifying the DPP content to accommodate local needs, such as obtaining menus from frequented fast-food restaurants and suggesting the healthiest options.

Only one study examined racial and ethnic differences in treatment outcomes. Littrell and colleagues (2003) reported that African Americans gained more weight in both their intervention and control groups compared to non-Hispanic Whites. These racial differences, however, were not statistically significant. More work in this area is clearly needed given the prevalence of racial/ethnic health disparities the U.S. (Smedley et al., 2002).

Implications for Practice & Policy

Our review of the literature suggests that lifestyle interventions that combine exercise, dietary counseling, and health promotion show promise in addressing some of the physical health needs of adults with serious mental disorders. This body of work indicates that for persons with SMI lifestyle interventions can achieve modest weight loss and reduction in cardiovascular risk factors that are clinically meaningful. These interventions are effective strategies that can be integrated into health and wellness efforts to improve the health and well-being of individuals living with SMI, enhance their recovery, and ultimately reduce premature mortality.

Attention to key cultural elements that impact lifestyle interventions such as diet, exercise, body image, and health promotion need to be carefully considered in order to make interventions culturally appropriate. This can also enhance treatment engagement, retention, and ultimately physical health outcomes.

More work in this area is needed to identify which intervention elements require cultural adaptation and to test the efficacy of these interventions with racially and ethnically diverse populations. As the evidence in this area continues to grow, studies are needed to assess the cost-effectiveness, implementation, and sustainability of these lifestyle interventions in real-world community-based settings to close the gap between research and practice. The growth of the unmet health needs of adults with SMI requires systematic efforts by mental health professionals of all disciplines to enhance their training, knowledge, and skills (See Appendices A, B and C for physical health resources) on these critical health issues and use of evidence-based approaches to improve patients' recovery and wellness.



The New York State Center of Excellence for Cultural Competence at New York State Psychiatric Institute



The NYSPI Center of Excellence for Cultural Competence is dedicated to the study and development of culturally and linguistically appropriate mental health services for people with serious mental illness throughout New York State. The Center is combining intervention, services, and community-based participatory research to improve service availability, accessibility, and quality of care statewide.

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Appendix A.

Web-based Resources for Healthy Living

Association	Website Address	Key Features	Spanish Translation
American Diabetes Association	www.diabetes.org	Myth and Fact Checker, Event Finder, and Food and Fitness digest.	Yes
American Heart Association	www.americanheart.org	Cardiovascular Disease Information, Health Profilers, HealthVault™, and Event Finder.	Yes
Diabetes Prevention Program	http://diabetes.niddk.nih.gov/dm/pubs/preventionprogram/	Diabetes Awareness and Prevention Toolkits for Health Fairs and Similar Venues.	Yes
National Heart, Lung and Blood Institute	www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/	BMI Calculator, Menu Planner and Other Interactive Tools.	Yes
Surgeon General	www.health.gov/paguidelines/guidelines/	Physical Activity Guidelines for Americans.	Yes
U. S. Department of Agriculture	http://www.nutrition.gov	Nutrition and Healthy Eating Information.	Yes
Centers for Disease Control and Prevention	www.cdc.gov/nccdphp/dnpa/physical/health_professionals/promotion/index.htm	Tools for Promoting Physical Activity, Physical Activity Resources for Health Professionals.	Yes
National Network of Libraries of Medicine	http://nnlm.gov/outreach/consumer/chspanish.html	Comprehensive List of Consumer Mental and Physical Health Education.	Yes

Appendix B.

Synthesis of U.S. Department of Health and Human Services (HHS) 2008 Guidelines for Physical Activity

Available at <http://www.health.gov/paguidelines/pdf/paguide.pdf>

- **Physical Guidelines for Adults**

- ✧ All adults should avoid inactivity. Some physical activity is better than none, and adults who participate in any amount of physical activity gain some health benefits.
- ✧ For substantial health benefits, adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.
- ✧ For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate-intensity or 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity activity. Additional health benefits are gained by engaging in physical activity beyond this amount.
- ✧ Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.

- **Physical Guidelines for Older Adults**

The Key Guidelines for Adults also apply to older adults. In addition, the following guidelines are just for older adults:

- ✧ When older adults cannot do 150 minutes of moderate-intensity aerobic activity a week because of chronic conditions, they should be as physically active as their abilities and conditions allow.
- ✧ Older adults should do exercises that maintain or improve balance if they are at risk of falling.
- ✧ Older adults should determine their level of effort for physical activity relative to their level of fitness.
- ✧ Older adults with chronic conditions should understand whether and how their conditions affect their ability to do regular physical activity safely.

- **Physical Guidelines for Adults with Disabilities**

- ✧ Adults with disabilities, who are able to, should get at least 150 minutes a week of moderate-intensity, or 75 minutes a week of vigorous-intensity aerobic activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.
- ✧ Adults with disabilities, who are able to, should also do muscle-strengthening activities of moderate or high intensity that involve all major muscle groups on 2 or more days a week, as these activities provide additional health benefits.
- ✧ When adults with disabilities are not able to meet the Guidelines, they should engage in regular physical activity according to their abilities and should avoid inactivity.
- ✧ Adults with disabilities should consult their healthcare provider about the amounts and types of physical activity that are appropriate for their abilities.

Appendix C.

Synthesis of Findings from the Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes

A battery of evidence-based research on the effects of the usage of second-generation antipsychotics (SGAs) has demonstrated a correlation between metabolic abnormalities and increasing body weight while taking SGAs. Among the three most prevalent adverse outcomes associated with SGA usage are obesity, diabetes, and dyslipidemia. Among the most frequently prescribed SGAs, clozapine and olanzapine were found to be associated with the greatest weight gain and highest levels of diabetes and dyslipidemia, followed by risperidone and quetiapine which exhibited intermediate effects

on these cardiovascular disease indices. Less frequently used agents, aripiprazole and ziprasidone, were found to be associated with little to no significant weight gain, diabetes, or dyslipidemia. Expert consensus panels concluded that the decision on implementing a particular therapeutic should rest on a variety of factors including the nature of the patient’s psychiatric condition and treatment (ADA et al., 2004; Marder et al., 2004). Below are two tables detailing best practices in charting the treatment course of patients with SMI who are experiencing SGA-induced adverse health effects.

Table 1. Monitoring Protocol for Patients on Second Generation Antipsychotics*

	Baseline	4 weeks	8 weeks	12 weeks	Quarterly	Annually	Every 5 years
Personal/Family History	X					X	
Weight (BMI)	X	X	X	X	X		
Waist Circumference	X					X	
Blood Pressure	X			X		X	
Fasting Blood Glucose	X			X		X	
Fasting Lipid Profile	X			X			X

*Most frequent assessments may be warranted based on clinical status. Adapted from the Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes, ADA et al., 2004; Marder et al, 2004.

Appendix C.

Synthesis of Findings from the Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes

**Table 2.
Second Generation Antipsychotics and Metabolic Abnormalities**

Generic Name	Trade Name	Weight Gain	Risk of Diabetes	Worsening Lipid Profile
Clozapine	Clozaril	+++	+	+
Olanzapine	Zyprexa	+++	+	+
Risperidone	Risperdal	++	D	D
Quetiapine	Seroquel	++	D	D
Aripiprazole*	Abilify	+/-	-	-
Ziprasidone*	Geodon	+/-	-	-

+ = increase effect; - = no effect; D = discrepant results.

***Newer drugs with limited long-term data. Adapted from Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes, ADA et al., 2004; Marder et al., 2004.**